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EDITORIAL ANNOUNCEMENTS.

THE BRITISH AND EASTERN CONTINENTS edition of the Railroad Gazette is published each Friday at Queen Anne's Chambers, Westminster, London. It consists of most of the reading pages of the Railroad Gazette, together with additional British and foreign matter, and is issued under the name Railway Gazette.

CONTRIBUTIONS.—Subscribers and others will materially assist in making our news accurate and complete if they will send early information of events which take place under their observation. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired.

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VOL. XLI., No. 19. FRIDAY, NOVEMBER 9, 1906.

The announcement last week of an increase in the annual dividend rate on Pennsylvania Railroad stock from six per cent. to seven per cent., following, as it does, increases by the Union Pacific, Southern Pacific, Atchison, Norfolk & Western and Baltimore & Ohio, was not a great surprise. In common with other roads, the Pennsylvania has enjoyed an unprecedented volume of business during the last two years. More than this, the road is in better condition than ever before to take care of its traffic; many of the far-reaching improvements begun four or five years ago have been completed. The Brilliant cut-off, Enola yards, Altoona yards, low-grade eastbound freight line, Trenton cut-off, Philadelphia terminals, and the Greenville yard are all in use. An average daily freight train load of 3,000 tons behind the tender is moving over the main line of the road in both directions and the terminal yards are filled with cars awaiting shipment. These improvements, all related to each other, have cost many millions and their earning power has just now become evident. It is suggested in the $3,000,000 required for the added one per cent. in dividends on $305,000,000 of capital stock.

Stuyvesant Fish is no longer president of the Illinois Central Railroad. At a meeting of the Board held in New York City on November 7, his long and successful service in that position was brought to an end by the votes of eight of the 13 directors, the vice-president in charge of operation being elected to succeed him. The reason for his dismissal lies in his now famous statement: "I have been president of the Illinois Central for nearly 20 years and I hope to be president for many years longer, but I never have been and I never will be a Harriman president of the Illinois Central." Two weeks ago, after the annual stockholders' meeting in Chicago, we briefly reviewed in these columns the events which led up to the open breach with Mr. Harriman. Mr. Fish now stands defeated by the very men who, three weeks ago, were elected directors by the votes which he, according to agreement, cast for them. It is a curious and disquieting spectacle of a past president of the American Railway Association and of the American section of the International Railway Congress, a railroad executive whose name has been bound up for years with the splendid reputation of his road, having to step down and out because he dared to defy interests representing, as nearly as can be learned, less than one-third of the ownership of the road. The outcome is an evidence at the same time of the tremendous power of Mr. Harriman and of the way in which this power is applied. The Illinois Central is a prize, indeed, and of especial and peculiar value to Mr. Harriman; but hardly worth what he appears to have paid for it. An agreement kept in letter but violated in spirit, a meeting hastily called at a time when a loyal vice-president and director was too ill to attend, and another supporter of the head of the road—no less a person than the governor of the state under which the company holds its charter—could only with great inconvenience be present, a winning over of another vice-president by the hollow reward of a presidency under Harriman, these are the methods of a period of railroad finance which it is disheartening to see revived. As for the 9,000 small stockholders, whether or not the change proves to be for their advantage, they would seem to be, for a year at least, at the mercy of the declarer of the recent Harriman dividends. When the Hill roads bought the Burlington, they took away control from the stockholders by paying for it. The Illinois Central has, it appears, been obtained in a less expensive manner, by winning over the representatives of the shareholders. In Wednesday's election Mr. Harahan received the votes of E. H. Harriman, Cornelius Vanderbilt, John Jacob Astor, Walther Luttgen, John W. Auchincloss, Robert W. Goelet, J. T. Harahan and Charles A. Peabody, president of the Mutual Life Insurance Company.

The order of the Interstate Commerce Commission of September 15 allowing the railroads until November 1 to equalize export cotton rates through the various ports by applying the lowest combination through all the ports without publication and filing, provided the rates were posted in each station affected and mailed to the Commission, has expired by limitation and there is no immediate prospect that it will be renewed. The export cotton business will now have to be carried on under two other provisions of the order of September 15, directing that "no published rates on cotton shall be advanced except on 30 days' notice as required by law," and that until March 1, 1907, carriers may reduce their published export rates on cotton to the various ports of export upon three days' notice." This matter of rates on export cotton is of special interest to the South Atlantic and Gulf ports and to the railroads leading to those ports. It is claimed that, owing to frequent and wide fluctuations in ocean rates from southern ports, these ports

cannot compete with New York and other northern ports for export cotton business unless the railroads are allowed to change their rates as often as the ocean rates change, so as to keep the through rail and ocean rates to European ports substantially equal through all the ports. The roads leading to the southern ports would, of course, prefer stable rates on export cotton if they could be assured of the same amount of tonnage. The practice of equalizing rates has been continued as it has been believed to be necessary in the interests of the ports, the shippers and the railroads. It was on the application of the southern roads that the order of September 15 was issued. Those who favor an extension of that order so as to permit changes either up or down without notice, contend that the privilege of reducing rates on three days' notice will be of little or no practical value, as a road will be reluctant to make a reduction when ocean rates go up, if it knows that it cannot restore the old rate again without 30 days' notice. It is also contended that Congress had the export cotton rates in mind when the Commission was given complete discretion as to the enforcement or modification of the 30-day requirement, and that it was the intention to allow the roads to continue equalization of these rates without restriction. As cotton exports for this season are now fairly under way there is no doubt that the southern ports will be heard from if their business is seriously injured.

THE C., H. & D.-PERE MARQUETTE RECEIVERSHIPS.

It was a little more than a year ago that the announcement was made that Messrs. J. P. Morgan & Co. had bought the Cincinnati, Hamilton & Dayton-Pere Marquette combination at a price of $160 a share for the controlling C., H. & D. stock. Soon followed in quick succession the sale of the roads to the Erie, the cancellation of this sale and the appointment on December 4, 1905, of Judson Harmon as receiver of each company. Since that time, although interest is in default on $15,000,000 C., H. & D. collateral trust notes, no definite steps have been announced toward putting the roads on their feet financially, which is probably to be done by separating them entirely and turning over each road to one of the stronger companies.

The annual reports of each company, reviewed in another column, are of interest in these days of wonderful railroad prosperity as recalling the financial methods of a corporate institution now happily remote, but common enough in the days of 1893 to 1897. Receiver's balance sheets, receiver's income accounts, receiver's certificates; these are strange terms to-day. But along with them appear new evidences, if any were needed, of the sort of financial management which brought these two roads under the jurisdiction of the court. Without going into the tremendous burden of new capital which was loaded on them, it is instructive to consider the evidences of bad management found in the operating expense accounts and in certain bookkeeping methods.

It is at once noticeable that the receiver has saved money on the non-productive expense accounts and spent more on maintenance. On both roads, considerable savings have been made in salaries of general officers, general office expenses and supplies, and "other general expenses," the saving in the last item being in each case more than half the cost in the previous year. In spite of the fact that the ton mileage of one road increased by over 100,000,000 and of the other by nearly 300,000,000, conducting transportation cost was smaller than in 1905. It is only by examining the unit maintenance figures that the real extent to which the roads were under-maintained during the two previous years can be realized. As shown in the tables given in the reviews of the reports, in 1904 the C., H. & D. was getting along on $767 per mile of road spent for maintenance of way; the Pere Marquette spent only $533. The first of these figures is low enough in all conscience for a road in trunk line territory; the second is absurd. No 2,000-mile railroad with a through Buffalo-Chicago line can be maintained for anything like $533 a mile. Even the $698 spent last year is entirely too low. Beggars, however, cannot be choosers. The 1904 charge of $21 per freight car on the same road is perhaps the worst figure of the whole showing, particularly as little more was spent in 1905, when maintenance cost $25 a car. The hand of the receiver is plainly seen in this item for 1906, when $38 a car was spent, a figure which will undoubtedly be raised as soon as funds are available. Similarly, on the C., H. & D., the cost of freight car repairs rose last year from $33 to $46 a car. There is no need of going into the subject further to prove that neither road was being anywhere nearly kept up to modern standard.

As further illustrating what led to a receivership a few unusual bookkeeping methods mentioned in this year's report of the C., H. & D. in explanation of seeming inconsistencies, are worth notice. It appears, for instance, that over $100,000 of overcharges paid back to shippers by the railroad in 1905 on shipments carried in 1902, 1903 and up to July 1, 1904, that is, in previous fiscal years, was in June, 1905, credited to freight earnings for that month, being at the same time charged direct to profit and loss. A half year's taxes were omitted in 1905, so that in order to bring tax payments up to date this year it was necessary to include this extra amount, thereby charging this year with half of the previous year's payments, besides its own. Most serious of all in its suggestion of impending disaster, is the fact that on $8,250,000 of 4 per cent. refunding bonds which drew interest throughout the fiscal year 1905, only four months interest was charged to income, the remainder being charged to capital account. When a railroad company begins to capitalize its interest payments in order to protect its income account, it is the beginning of the end.

It is clear that these two companies have the unsavory distinction of being the only important railroads in the country in a receiver's hands directly as a result of a financial and operating policy which could tend to no other result. The most remarkable thing about the whole situation is the fact that a company in such unsound condition as the Cincinnati, Hamilton & Dayton was a year ago could be sold to the most prominent railroad banking house in the country at a price for the stock of $160 a share. The necessity which the trunk line community of interest had of getting the combined roads with their large potential power as rate disturbers under control is thereby all the more strongly emphasized.

THE NETTING AND DIAPHRAGM IN LOCOMOTIVE FRONT-ENDS.

Gradually the mysteries of the locomotive front end have been disclosed. Ten years ago experiments on the testing plant developed the proper form and character of the exhaust jet and the fundamental principles involved in the design of exhaust pipes. Later the stack received attention, first as applied to a small locomotive and more recently as applied to larger and more modern locomotives. Last of all, the petticoat, or draft pipes, have been scientifically investigated. The only parts of the front end which have not yet been carefully studied are the netting and the diaphragm. These two details have no active part in bringing about the draft action, and have naturally been left till the last. From the point of view of draft production the netting and diaphragm are necessary evils. They are like the tubes of the boiler, mere elements, creating resistance to the forward movement of the gases. The effort therefore in perfecting their design should be to reduce their effect upon the draft to a minimum.

The netting, when well designed and properly maintained, offers so little resistance to the movement of gases that its effect is hardly measurable. But if, through neglect, its meshes become filled with soot or solid particles to such an extent as to materially reduce the area of its openings, the netting becomes a serious drag on the draft. Difficulties arising from this cause are reduced by providing a liberal area of netting. When the size of wire has been chosen, there is in fact but a single principle to be observed in the design of this detail, and that is fulfilled when the area of netting is made as large as possible. For locomotives burning bituminous coal the area of the netting should be made equal to the area of the cross section of the smokebox. Thus, a smokebox 6 ft. in diameter should have an area of netting of not less than 28 sq. ft. Thus designed, the resistance of the netting will, under usual conditions, be less than 1 per cent. of the total draft resistance.

The diaphragm absorbs from 30 to 60 per cent. of the energy induced by the draft action. Now that the properties of the exhaust nozzle and stack have been determined, it remains the most important, undetermined element in the arrangement of the front end. There are two functions to be served by the diaphragm, checking the velocity with which the gases flow through the upper tubes sufficiently to equalize the draft action on the fire, and forming the current of gases into a jet sufficiently strong to clear the front end of cinders. The problem in designing is to determine how the diaphragm may be made to perform these functions, and at the same time offer as little resistance as possible to the progress of the gases. That it may serve to check the draft in the upper tubes the upper portion must lie near the tube sheet while the lower edge must be sufficiently near the front of the smokebox to prevent cinders finding lodgment there. The outline by which the diaphragm is extended from top to bottom is often marked by several rather

abrupt angles. If these were to give way to smooth curves, it is not unlikely that the resistance offered would be materially reduced. Again, the discharge from the diaphragm is now ordinarily directed against the front ring of the smokebox. The stream of gases with its burden of cinders is shot into a corner from which the cinders are required to turn and rebound as best they may. These sources of resistance could be reduced by better designing. If there were inserted within the smokebox a false bottom of firebrick or of steel, for the purpose of giving smoother lines to guide the flow of gases, then the resistance of the diaphragm could be reduced without interfering with its effectiveness in clearing the front end. Such a false bottom should begin at the base of the exhaust pipe and extend forward in a gradual but constantly increasing upward curve becoming wider as it proceeds, until it meets the front of the smokebox at the bottom of the front door, at which point its curvature should be such as to rise nearly vertically. Above this would extend that portion of the diaphragm which is forward of the nozzle, shaped to correspond with this false bottom, its edge turning up to permit an easy flow of the gases from under it. Such a design would greatly reduce the resistance offered to the flow of the gases. It would be open to a single objection, namely, that it would project all solid particles directly against the netting. Whether this would materially shorten the life of the netting cannot be stated off-hand, but it is certain that if the angles which now lie in the course of the gases, are needed to break up the solid particles, they are expensive devices for crushing coal.

The form of the diaphragm having been determined, the area of the opening under it should be as large as possible. As a problem of design this detail is similar to that of the exhaust tip. The force of the stream must be sufficiently strong to clear the front end; if stronger than this, energy will be wasted. Perforating the upper portion of the diaphragm is obviously defective since bypassing the gases enfeebles the main jet which has work to do in carrying out the solid particles. The discharge should be in a solid stream, the pressure behind the diaphragm being reduced to a minimum by giving liberal proportions to the opening under it.

THE VALUE OF INVESTIGATING.

A few years ago the superintendent of motive power of a large railroad succeeded in persuading his directors to allow him to engage a chemist and establish a small testing laboratory. Within a year he was able to demonstrate to the managers that the testing laboratory in the one item of boiler plate in the first six months of its use had saved more than the whole cost of its establishment and maintenance. It is needless to add that it is still in service on that road.

Recently the general manager of a railroad supply company thought that he would like to know exactly the relative merits of his own product as compared with that of his competitors. He, therefore, engaged an independent engineer to make a series of thorough tests, not only of his own product but of all other articles of its class on the market. The report was to be confidential. There was no way of telling at the time what results the investigation would bring forth. They might be to the detriment of this particular manufacturer's product and they might not. It was to be a search after the truth for the truth's own sake. The results justified the expense, for within ten days of presentation of the report an order was booked, based solely upon its representations, that paid fourfold all expenses of the investigation.

Again a railroad company was in trouble; there was a dispute between different departments as to the cause, and an outside engineer was called in to investigate and report. A painstaking examination led to such a showing of facts that each department was held to be a contributor to the trouble, but neither to be wholly responsible. The work was done in such a way that both sides were convinced of its fairness and accuracy and each proceeded to remove the causes specified.

These are instances where special work, in the form of what may be called scientific investigation, has paid—paid not only in satisfaction derived from work well done, but in dollars and cents. Usually an investigation comparing different makes of product is done under government auspices or by a committee of an association from which the commercial aspect of the case is entirely eliminated, but for such work to be done by a business firm with the sole idea of proving its product to be the best on the market, or of making it the best, is as rare as it is commendable. We are all working out the products of the labors of the past; we take advantage of every secret that has been drawn out from nature and make the most of it in its practical application to everyday life, and we one and all recognize our dependence on the work of our predecessors, especially after our attention has been called to it. Most manufacturers, however, are apt at first thought to give more credit to the man who made the practical application of a principle than to the quiet worker in the laboratory years before who by his formulation of the foundation principle made the practical application possible.

An American engineer filled to the brim with practical ideas for short-cuts in shop work was in Germany a few years ago. He visited the shops and on his tours of inspection made frequent suggestions. Whenever he offered one he was greeted with the surprised expression of praise: "You Americans are so practical." It is quite possible that in the past we have been altogether too exclusively practical. Take the locomotive as an example. How little was done up to 1880 in real development except by the unscientific methods of rule of thumb and trial and error. Hardly a master mechanic in the country had the courage of his convictions and dared even to advocate an improvement that he thought would be successful, because he did not have the scientific training back of him to sustain him in his recommendations. If a side rod broke he simply replaced it with another of a heavier section and waited for the new one to break, which it usually did. With the advent of the man with a technical education in positions of control, investigation became more and more common. To-day most large roads have a corps that devotes its time solely to examination of supplies and investigations that lead to improvement in specifications. The reason such a department of tests has become common is that it has been found to pay.

There is, however, something more to be done than mere compilation of specifications and performance of detective work to see that these specifications are lived up to in the supplies furnished. There is the collection of such data as that described in the first part of this article by which a manufacturer may know exactly how he stands with reference to his competitors or what should be done in order to advance the quality of his product. It is in this direction that more work should be done, and the more that is thus accomplished the wider will become the field for further research. The Germans have shown the value of painstaking investigation and its final development in practical form more than any other people. They have long been regarded as a nation of theorists. The old sneer of, "Who reads an American book?" might a few years ago have been paraphrased to read, "Who uses a German machine." The changed reply to either question to-day is as emphatic in one case as in the other. German advancement during the past twenty years has been due not only to persistent study of what others have been doing but to delving into dark regions and then taking advantage of the advance information thus secured.

It is, of course, useless to appeal to the average manufacturer to indulge in pioneer work of this kind on the altruistic basis of the benefits he will confer on humanity, but from purely selfish motives profit can be made out of an impartial investigation of almost any commercial product. It is easy for a salesman to make extravagant statements about the superiority of his particular wares, as he usually knows that his listener is in no position to dispute him. But he also knows that that listener is discounting all that he says by a liberal percentage. If, however, he can back up his statements by proof positive of a character that would be accepted in court as evidence, he has placed himself in an impregnable position. It is for this reason that a scientific investigation pays, and pays well, and independent work of this sort cannot therefore be too strongly urged.

Cincinnati, Hamilton & Dayton.

The annual reports of the Cincinnati, Hamilton & Dayton and the Pere Marquette are unique among the railroad statements of the year in that both roads are in the hands of a receiver. They were placed in the hands of Judson Harmon, Receiver, on December 4, 1905. The reports, however, cover complete operations for both roads for the fiscal year ended June 30, 1906.

The receiverships came, it will be remembered, as the climax of a long series of new capital issues and buyings of control, resulting in the formation by Eugene Zimmerman and associates of the so-called "Great Central Route," which comprised the Cincinnati, Hamilton & Dayton, the Pere Marquette and the Chicago, Cincinnati & Louisville. The Cincinnati, Hamilton & Dayton was a road tapping rich traffic territory in Ohio and originating a large

amount of business which had hitherto in large part been turned over to the intersecting trunk lines. The Pere Marquette was a newly fledged Buffalo to Chicago trunk line, the Chicago extension having been opened at the beginning of 1904 and the Buffalo connection obtained later in the same year by agreement for traffic rights between St. Thomas, Ont., and Buffalo with the Michigan Central. The Chicago, Cincinnati & Louisville was lately built, and designed to be a through line from Cincinnati to Chicago, but lacked about 30 miles on its northern end of reaching the latter city. As a result of the combination, through traffic originating on the Cincinnati, Hamilton & Dayton, instead of going to the trunk lines at junction points on that road was hauled north from Cincinnati territory to Detroit and thence east or west over the through lines of the Pere Marquette. It was this possession of both a valuable traffic territory and a through line that brought about the taking over of the roads in the interest of the general trunk line community of interest. This purchase was made possible by the fact that the outstanding stock of the Cincinnati, Hamilton & Dayton which controlled the situation was of small amount, so that although the high price of $160 a share was paid, control of the whole combination could be acquired for something over $8,000,000. Following this purchase the roads were turned over to the Erie, the president of the Erie being elected president of the two larger companies. Six weeks later the Erie was allowed to withdraw from its bargain and the roads thus left independent were shortly thrown into a receivership, the Chicago, Cincinnati & Louisville, however, remaining an independent line pending suit.

This review deals with the Cincinnati, Hamilton & Dayton. The report of the Pere Marquette is reviewed in another column. The Cincinnati, Hamilton & Dayton operates a little more than 1,000 miles of line and had gross earnings last year of nearly $8,400,000, against slightly over $8,000,000 in 1905. Operating expenses increased $414,000, chiefly due to expenditures necessary to maintain roadbed and equipment up to modern standards, leaving net earnings somewhat under, instead of slightly over, $2,000,000 as in 1905. Following the income account farther, the bad results under the old management are even more clearly seen. Although there was no substantial increase of taxes during the year 1906, payments under that head increased $176,234, due to charging a half year's taxes, omitted in 1905. Net earnings after taxes consequently showed a decrease of over $200,000, but in this connection attention is called to the fact that the 1906 figures include only actual earnings, while the 1905 figures include items which were not earnings. For instance, in June, 1905, $106,000 of overcharge paid in 1905 on business done in previous fiscal years was credited to freight earnings for that month, the corresponding outgo being charged direct to profit and loss.

There was an increase of $812,000 in interest charges during the year caused by a larger charge of $490,000 interest on $15,000,000 4½ per cent. collateral trust notes and $312,000 larger interest payments on the 4 per cent. refunding mortgage of July 1, 1904. The collateral trust notes were not marketed until late in March, 1905, and the 1905 report included interest for only a fraction over three months. Of the 4 per cent. refunding mortgage bonds $8,250,000 were issued and drew interest from July 1, 1904, but only four months' interest on these bonds was charged to income account in 1905, the rest being charged to capital account. Although no payments have been made on the $15,000,000 collateral trust 4½ per cent. notes since September, 1905, the full year's interest on them has been charged in the 1906 income account. These examples show the way in which the income account was juggled under the old management. Owing to all these larger charges in 1906, the income account shows a deficit of $1,147,631 against a deficit of $241,224 in 1905.

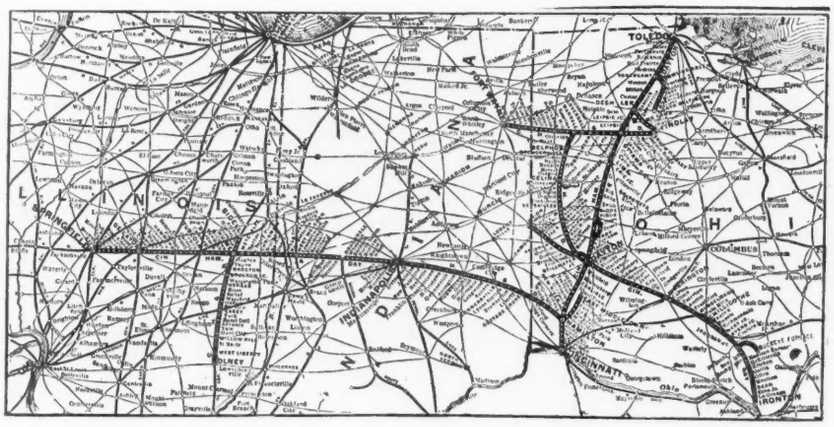
The detailed statement of operating expenses also bears witness to the same sort of management in 1905. General expenses show this most strikingly. Salaries of general officers decreased $9,000, while salaries of clerks and attendants increased $26,000. There was a saving of $10,000 in general office expenses and supplies, of $4,000 in stationery and printing and of $10,600 in "other expenses." The pruning knife of the receiver has here evidently found suitable material. Conducting transportation, in spite of the fact that there was an increase of over 110,000,000 ton miles in the traffic, shows a small decrease from the figure of the previous year. The principal reason for this is that the amounts paid for trackage rights, leased lines, etc., were treated as rentals and charged direct to income account instead of to operating expenses as in 1905. Another reason is to be found in the largely increased train load which rose from 302 tons of revenue freight in 1905 to 371 tons in 1906 and including company freight, from 324 to 400 tons. This well illustrates the success of the receiver in securing operating efficiency.

Instead of decreases, the maintenance accounts, which had been for at least the last two years seriously slighted, shows increases. Maintenance of way rose from $904,000 to $1,143,000, a gain of $239,000, and maintenance of equipment increased by an amount almost as large. The following table shows the unit maintenance charges on the Cincinnati, Hamilton & Dayton during the last three years. This is a striking exhibit of undercharges for maintenance:

	1906.	1905.	1904.
Maintenance of way, per mile	1,102	871	767
" of locomotives, per locomotive	2,108	1,920	1,957
" of freight car, per car	46	33	39
" passenger car, per car	487	473	458

It is evident that the 1904 and 1905 figures are much too low for proper maintenance of a railroad like the Cincinnati, Hamilton & Dayton. The low cost of maintenance of way in 1904, the small amount spent on freight cars in 1905 and the small passenger car repair charge in all three years are especially to be noticed.

There are three balance sheets included in the report, the consolidated general balance sheet including both the finances of the railroad company and of the receiver, the railroad company's general balance sheet and the receiver's general balance sheet. There are also corresponding income accounts and profit and loss accounts. The consolidated balance sheet shows current assets of $2,410,000, against current liabilities of $6,823,500. Cash in the receiver's hands is $318,687. On the other hand, unpaid vouchers amount to $2,289,000, and bills payable to $3,098,000. The second largest item among the assets is: Liability interest in stocks owned by Michigan Securities Company, $16,570,000. Leased and auxiliary lines also account for $16,440,000, these two items going far to balance the $47,944,000 of funded debt (including leased and auxiliary lines) outstanding. There was $1,050,946 charged to additions and improvements under capital account during the year. The profit and loss credit balance is $1,769,000. On the other hand, in the receiver's balance sheet there is a loss from December 4, 1905, to June 30, 1906, of $615,000 charged among the assets.



Cincinnati, Hamilton & Dayton.

During this period 5½ per cent. receiver's certificates amounting to $511,830 have been issued to provide funds for interest payments to January 1, 1906, on the following bonds:

Dayton & Michigan R. R. consolidated mortgage 5 per cent bonds	$68,200
Cin., Ham. & Dayton Ry. second mortgage 4½ per cent. bonds	45,000
Cin., Indianapolis & West'n Ry. 1st and refdg. mort. 4 pr. cent. bonds	93,440
Cin., Ham. & Dayton Ry. refunding mortgage, 4 per cent. bonds	226,140
Indiana, Decatur & Western Ry. first mortgage 5 per cent. bonds	79,050
Total	$511,830

The principal results of the last two years' operation are as follows:

	1906.	1905.
Mileage worked	1,038	1,038
Freight earnings	$5,996,802	$5,694,283
Passenger earnings	1,813,561	1,912,855
Gross earnings	8,398,418	8,008,918
Maint. way and structures	1,143,369	903,936
Maint. of equipment	1,404,704	1,201,603
Conducting transportation	3,640,160	3,661,326
Operating expenses	6,419,140	6,004,966
Net earnings	1,979,278	2,003,952
Fixed charges and taxes	3,247,645	2,342,405
Net deficit	1,147,631	241,224

Pere Marquette.

The review of the Cincinnati, Hamilton & Dayton report in another column sums up the circumstances leading to the receivership of the two roads and the present situation of that property. In connection with the Pere Marquette there is to be added the fact that in February, 1906, the company began a suit in equity in the United States Court at Grand Rapids, Mich., against William A. Bradford, Jr., President of the Chicago, Cincinnati & Louisville and

others to obtain a decree cancelling $3,500,000 bonds issued in July, 1904, in payment for the capital stock of the Chicago, Cincinnati & Louisville, on the ground that the bonds were issued under circumstances rendering them void in the hands of the then holders and that there was no authority to issue them. A preliminary injunction was issued restraining transfer of the bonds pending suit, which is now in progress. In the meantime the sellers of the stock of the Chicago, Cincinnati & Louisville are in possession of that road.

The Pere Marquette operates 2,333 miles of line. Its gross earnings last year were $13,430,000, an increase of $763,000 over 1905. Operating expenses show a small increase, leaving a gain of $745,000 in net earnings. A large increase in tax payments due to an increase in current payments as a result of the decision of the United States Supreme Court in the Michigan tax case, a considerable decrease in other income due to the fact that while the Pere Marquette received from the Cincinnati, Hamilton & Dayton during the previous year $321,000 as rental, during the last year no payments were made, and a total increase of $522,000 in interest and rentals, resulted in a net deficit from the year's operations of $860,947 against $22,430 in 1905. It is to be observed in this connection as showing that this deficit was not due to the actual operation of the road that the operating ratio for the year was 74 per cent. against 78 per cent. in 1905.

Although general expenses increased, there was a saving as in the case of the C., H. & D., in salaries of general officers, office expenses and supplies and other general expenses, the increase in the total account being due to larger payments to clerks and attendants. Conducting transportation account shows that in 1905 a deficit balance of $91,600 for switching charges was deducted from freight earnings instead of appearing in the expense accounts. An evidence of the better operation of the road lies in the fact that instead of a charge of $92,000 for car mileage in 1905, last year there was a credit in this account which was transferred to miscellaneous earnings. During the first half of the year the amounts paid for trackage rights, including maintenance and operating charges were charged to rents of buildings and other property. Since January 1, 1905, such rental has been charged to income account direct and the maintenance and other operating expenses distributed to the various operating accounts. This change in bookkeeping is responsible for more than half of the decrease in the total conducting transportation expenses. The decrease, however, is important in view of the fact that the total ton miles increased by nearly 300,000,000 during the year. Another evidence of greatly increased operating efficiency is the train load, which amounted to 312 tons of revenue freight against 251 tons in 1905 and, including company freight, 335 tons against 279 tons in 1905. There is a striking increase in the number of miles each ton of revenue freight was carried, from 157 miles to 171 miles.

The amounts spent for maintenance by the road during the last three years are of even greater interest than that of the Cincinnati, Hamilton & Dayton as showing how low maintenance can be allowed to run in these days of tremendous betterments. The following table shows the unit maintenance charges for the last three years:

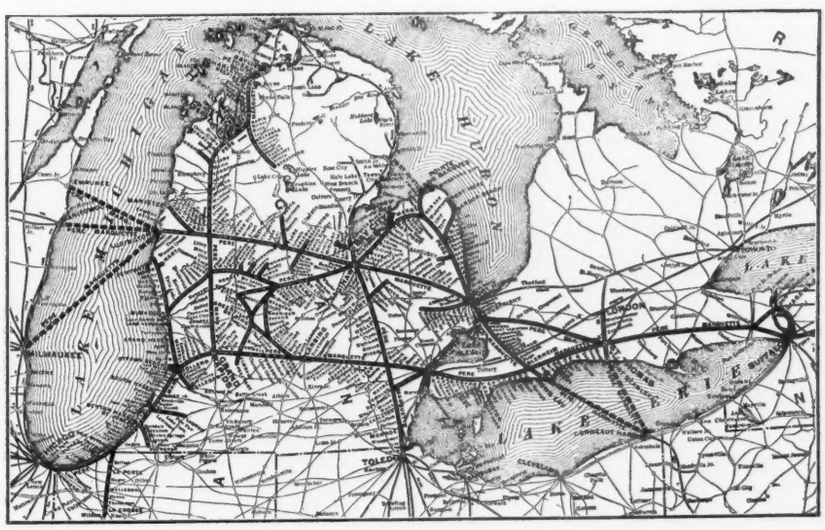
	1906.	1905.	1904.
Maintenance of way, per mile	698	720	533
" of locomotive, per locomotive	1,890	1,940	1,333
" of freight car, per car	38	25	21
" of passenger car, per car	437	441	409

The low level reached in any one of these charges in 1904 could not be duplicated on any important railroad in the country. The maintenance of way figure of $533 a mile, the expenditure of $21 per car for freight cars and $409 per passenger car are especially too small. Even last year, although the freight charge has been brought up to somewhere near the necessary level, the other charges are entirely too low for normal.

There are three balance sheets, income accounts and profit and loss accounts, as on the Cincinnati, Hamilton & Dayton. The consolidated balance sheet shows assets of $2,777,000, against current liabilities of $4,496,000. Cash in the receiver's hands was $599,000; on the other hand unpaid vouchers amounted to $2,088,000, and bills payable to $885,000. A profit and loss debit balance of $1,495,491 is shown. During the year $750,909 was charged to capital account for additions and improvements.

Between December 4, 1905, and June 30, 1906, $1,619,180 receiver's certificates were issued to provide funds as follows:

For interest payments, due Jan. 1, 1906, on the following bonds:	
Pere Marquette R. R. collateral trust indenture 4 per cent. bonds	$57,400
Pere Marquette R. R. consolidated mortgage 4 per cent. bonds	167,640
Pere Marquette R. R. refunding mortgage 4 per cent. bonds	184,140
Flint & Pere Marquette R. R. Detroit Division, first mortgage 5 per cent. bonds	10,000
	$419,180
Also, May 5, 1906, to provide funds for payment of back taxes and penalties in the state of Michigan for the years 1902-03-04-05	$1,200,000
	$1,619,180



Pere Marquette.

The report describes in some detail a decision made in May, 1906, in the Supreme Court of Michigan in the case of the Pere Marquette against the Wabash, affirming the decision of a lower court in a case involving important railroad property rights in Detroit. In January, 1903, a contract between the Wabash and the predecessors of the Pere Marquette covering the double track and property between Delray and Detroit, about four miles, including switching yards, terminal tracks, ferry slips and spur tracks expired in some of its features by limitation. The Wabash then made claim to exclusive ownership of a large part of the property and joint ownership with the Pere Marquette of only the northerly main track. On suit brought by the Pere Marquette, the decision of the lower court was in its favor on all the points involved. With the exception of one minor point, the decision of the Supreme Court is of the same tenor, declaring that the Pere Marquette and the Wabash are owners in common of the double main track from Delray to the switching grounds, of all the spurs and sidings leading therefrom, which reach many industrial points and are several miles long, of the lower of the two ferry slips built several years ago, and of the so-called ferry slip tracks. The case involved construction of leases made in 1881, 1889 and 1890 and of agreements made in 1893 and 1894. An adverse decision would have seriously crippled the road in its position at Detroit.

The principal results of the last two years' operations are as follows:

	1906.	1905.
Mileage worked	2,333	2,327
Freight earnings	$9,605,899	$9,049,573
Passenger earnings	3,239,447	3,121,217
Gross earnings	13,430,170	12,667,420
Maint. way and structures	1,627,307	1,715,232
Maint. of equipment	1,897,036	1,547,548
Conducting transportation	5,563,681	5,843,596
Marine operation	436,915	427,996
Operating expenses	9,993,094	9,915,777
Net earnings	3,497,076	2,751,643
Fixed charges and taxes	4,519,377	3,215,110
Net deficit	860,947	22,430

Detroit & Mackinac.

The Detroit & Mackinac runs from Bay City, Mich., north along the west shore of Lake Huron, and then northwest to Cheboygan, 195 miles. There are 148 miles of short branches, most of which were built to open up timber lands. Most of the traffic of the road is in timber; of the 1,109,055 tons of freight carried in 1906, 11 per cent. was lumber and 42 per cent. forest products other than lumber, that is to say, unsawed logs and pulp wood. A great proportion of the timber is hard wood, since from Presque Isle County northwest the D. & M. taps the hard wood strip which runs north and south through most of the lower peninsula of Michigan. Another important item of freight is stone and sand, 24 per cent. The total freight carried increased 198,215 tons as compared with the year 1905. The company pays 5 per cent. on its $950,000 preferred stock; it has $2,000,000 common stock and $2,950,000 funded debt.

During the year 17 miles of new branches were built and five

miles of branches taken up. Maintenance of way cost $200,400, an increase of $13,600. The maintenance charges per mile were $585 in 1906 and $565 in 1905. In this connection it may be noted that during the past year the company has renumbered all its bridges and culverts and filed their specifications in the Chief Engineer's office. This work had never been done so completely before on this road, and the fact that it has now been done is an indication that the company is falling in line, as regards maintenance, with the higher standards of larger roads. In his characteristic address to the stockholders, President Hawks remarks: "When we bought the Alpena & Northern there were three places where bad reverse curves had been used to detour around houses. These houses have been bought and removed, and line put in proper location as a straight line."

The company had in operation on June 30, 1906, 30 locomotives, 46 passenger cars, 1,616 freight cars and 35 work cars. During the year 17 passenger cars, 381 freight and two work cars were bought. In this connection the President says: "We had two consolidation locomotives with 51-in. drivers that began wearing flat spots on drivers as soon as they left the shop, and the makers could not remedy the trouble, which came from the fact of our having a level and straight road. As these locomotives were pounding track to pieces, we sold them and ordered three new ones, somewhat heavier, and with larger drivers. These were delivered in September, 1906." On this account the cost of maintenance of equipment increased over 100 per cent., being $259,000 in 1906 and $113,000 in 1905. Conducting transportation increased from $306,800 to $384,200. The number of tons carried one mile per mile of road was 274,103, an increase of 48,846. This increase in freight density was taken care of by increasing the average train load from 227 tons to 252 tons.

The principal results of operation for the last two years are as follows:

	1906.	1905.
Mileage worked	343	331
Freight earnings	$820,487	$697,818
Passenger earnings	263,779	239,644
Gross earnings	1,154,826	990,555
Maint. of way and struct.	200,383	186,828
Maintenance of equipment	259,394	113,370
Conducting transportation.	384,236	306,813
Operating expenses	873,134	635,071
Net earnings	281,693	355,482
Special appropriations	.....	296,051
Surplus	5,257	10,918

CONTRIBUTIONS

Baltimore & Ohio Track Inspection Car.

Pittsburg, Pa., Nov. 5, 1906.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note in your issue of November 2 a very interesting description of the track inspection car of the B. & O. R. R.

I have no criticism of this article to offer, until we reach the last paragraph, in which the names are mentioned of every one who had anything to do with the construction of this car, except that of the one man to whose mechanical genius the entire system of recording devices is due: Mr. C. M. Bennett, late superintendent of the C. & M. V., one of the subsidiary lines of the Pennsylvania lines west of Pittsburg.

The recording apparatus was designed and put in use by Mr. Bennett during the period when Mr. L. F. Loree was general manager of the Pennsylvania lines, and under his direction was used at stated periods over these lines; the installation in the car, however, was not permanent, but the apparatus was removed after each trip, and reinstalled again for the next trip.

After Mr. Loree went to the B. & O. he engaged Mr. Bennett to make one or two trips with his device, over the lines of that system. Following that he arranged with Mr. Bennett for the right to use his invention in a permanently equipped car, to be built by the B. & O.

In carrying out this scheme as I have been informed, the only modifications made were such as would naturally occur in changing a temporary to a permanent installation, and to this extent the gentlemen named in the article are entitled to credit, but no farther.

I am constrained to write this in behalf of my late friend, Mr. Bennett, for the reason that he passed to the "beyond" during the past summer and cannot speak for himself.

THOMAS H. JOHNSON,
Consulting Engineer.

The plan for reduced fares for long distances on the Italian railroads goes into effect Nov. 1. Beginning with 150 kilometers (93 miles) the rates are reduced by zones from 10 to 60 per cent., and so that a ticket for 962 miles will be good for any greater distance. For this distance the fares will be $7.14, $11.31 and $16.97 for the three classes respectively. The fare from Rome to Turin will be $4.80 third class against $7.31 heretofore; from Naples to Venice, $5.26 against $8.93; from Modane, at the Italian end of the Mt. Cenis tunnel, to Girgenti, which is about the longest journey possible in Italy (1,111 miles), $7.14 against $19.57. The reductions in the higher class are proportionally not so great.

Wages on the Pennsylvania and the Reading.

The Pennsylvania Railroad announces that on December 1 the wages of all permanent employees east and west of Pittsburg will be increased 10 per cent., excepting a considerable number of officers whose pay was increased October 1. The total number affected will be about 192,000. An advance of 10 per cent. will mean a monthly increase in pay of $1,000,000—$600,000 on the lines east of Pittsburg and $400,000 on the lines west, the monthly payroll of the combined system averaging about $10,000,000. During the busy months of the year the increased number of employees brings this amount up to nearly $12,000,000.

In connection with the announcement there was published the following interesting list showing how the employees of the road east of Pittsburg and Erie are distributed:

General departments and offices	5,051
General agent, New York	2,665
General agent, Baltimore	862
General agent, Washington	273
General agent, Erie	87
Juniata shop	1,886
Altoona machine shop	5,893
Altoona car shops	4,158
South Altoona foundries	924
Philadelphia Terminal Division	8,687
Philadelphia Division	11,462
Schuylkill Division	1,387
Middle Division, Penn. R. R.	7,229
Bedford Division	189
Tyrone Division	1,324
Cambria & Clearfield Division	844
Pennsylvania & Northwestern Division	833
West Pennsylvania Division	2,517
Pittsburg Division	14,171
Monongahela Division	3,566
General agent, Pittsburg	396
Trenton shops	438
New York Division	12,166
Amboy Division	4,090
Belvidere Division	1,551
Delaware and Raritan Canal	380
Sunbury & Lewistown Divisions, P. & E. R. R.	1,986
Eastern Division, P. & E. R. R.	3,140
Middle & Western Divisions, P. & E. R. R.	3,719
Buffalo & Rochester Divisions, B. & A. V.	3,624
Chautauqua Division, B. & A. V.	1,271
River & Low Grade Divisions, B. & A. V.	3,639
Baltimore Division, Nor. Cent.	4,057
Susquehanna Division, Nor. Cent.	392
Shamokin Division, Nor. Cent.	192
Elmira & Canandaigua Division, Nor. Cent.	1,529
Maryland Division, P., B. & W.	7,145
Delaware Division, P., B. & W.	1,424
Central Division, P., B. & W.	603
West Jersey & Seashore R. R.	2,815
Total	128,565

Quickly following the Pennsylvania announcement it was given out officially that the Philadelphia & Reading would from November 1 increase by 10 per cent. the wages of all its employees receiving $200 a month or less.

Railroad Decisions in October.

The following abstracts cover the principal decisions in railroad cases handed down during October by the United States Supreme Court and the other federal courts:

Effect of Release of Damages by Employee.—A release of damages by an injured railroad employee to the railroad company for injuries caused by coming in contact with a trolley wire stretched across the track will not likewise release the street railway company for liability for its sole negligence in not raising the wire to the proper height. The street railway company contended that the railroad was jointly liable and hence the release of one released the other, but the negligence of the railroad, if any, consisted merely in omitting to inform its employee of the negligence of the street railway company, and this, of course, did not amount to an act of joint negligence. Pittsburg Railway Co. vs. Chapman, 145 Federal Rep. 886.

Injuries to Employees Engaged in Loading Cars on Barge.—A gang boss of men engaged in loading cars on barges is a fellow servant of a member of the gang, and the railroad company is not liable for injuries suffered by him in consequence of the negligence of the boss. In all cases where the railroad has provided proper appliances to make work of this character safe, it is not under any personal obligation to see that such appliances are immediately replaced after being temporarily removed by a fellow workman. Baltimore & Ohio vs. Brown, 146 Federal Rep. 24.

Joint Prosecution for Rebating Under Elkins Act.—The interstate commerce act as amended by the Elkins act allows the prosecution of the carrier and its agents for the same offense in a single indictment. United States vs. New York Central & Hudson River, 146 Federal Rep. 298.

Railroad Aid Bonds.—Where the act authorizing the issuance of county railroad aid bonds is silent on the subject of their execution, they may be executed by the commissioners of the county.

Though the act directs the delivery of the bonds by trustees provided by the act, a delivery by the county commissioners will not invalidate them. Neither will the bonds be invalidated by the fact that they provide for annual instead of semi-annual payments of interest as directed by the statute since the railroad will be entitled to waive a provision in its own favor. Board of Commissioners vs. Tollman, 145 Federal Rep. 753.

Construction Contract.—The mere fact that a provision in a construction contract gives the railroad company authority to pay the claims of laborers employed by the contractor and to deduct the amount from that due him under the contract, does not oblige the company to do so in the sense that the contractor's trustee in bankruptcy can compel such payments, without regard to the claim of the company against the contractor because of defective work. Norfolk & Western vs. Graham, 145 Federal Rep. 808.

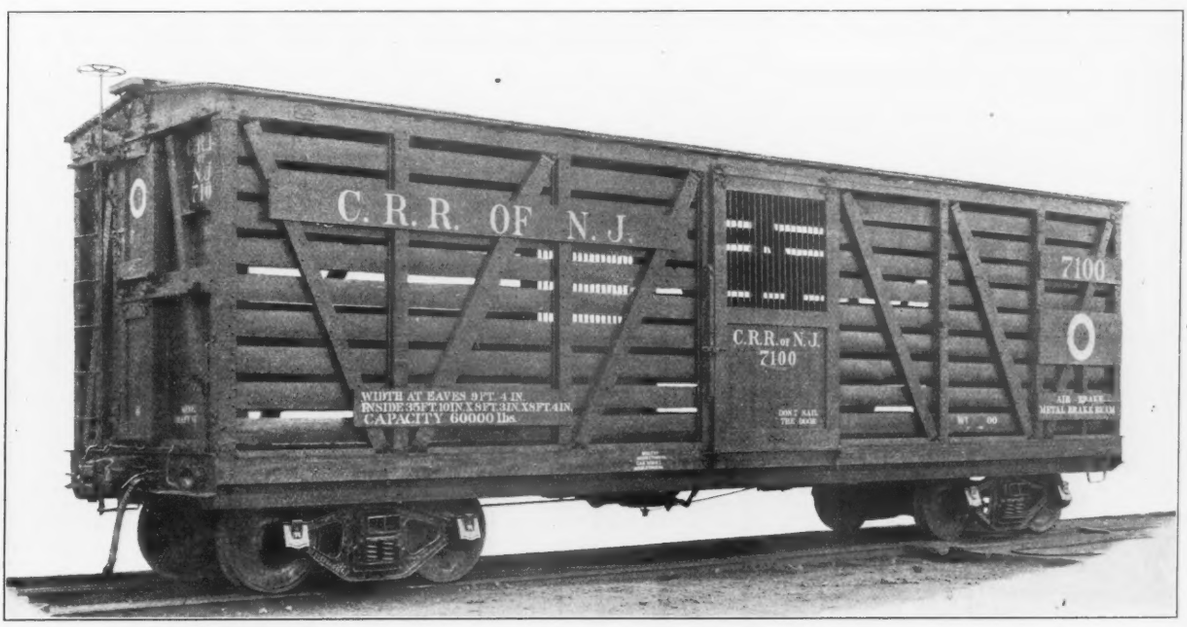
Montana Employers' Liability Act.—The Montana statute abolishing the fellow servant rule in cases where injury to an employee is caused by the negligence of any train despatcher, telegraph operator, engineer, etc., does not cover an injury sustained by a servant of a railroad caused by the negligence of the operator of a stationary engine used to draw a plow along the floor of flat cars for the unloading of gravel. The term "engineer" has reference only to locomotive engineers. Reinke vs. Northern Pacific, 145 Federal Rep. 988.

"Party Interested in the Traffic" Under Elkins Act.—A refrigerator company organized for the purpose of controlling interstate transportation of a brewing company, entering into contracts for rebates with certain railroads is a "party interested in the traffic" under the Elkins Act and subject to prosecution for its violation. United States vs. Milwaukee Refrigerator Transit Co., 145 Federal Rep. 1,007.

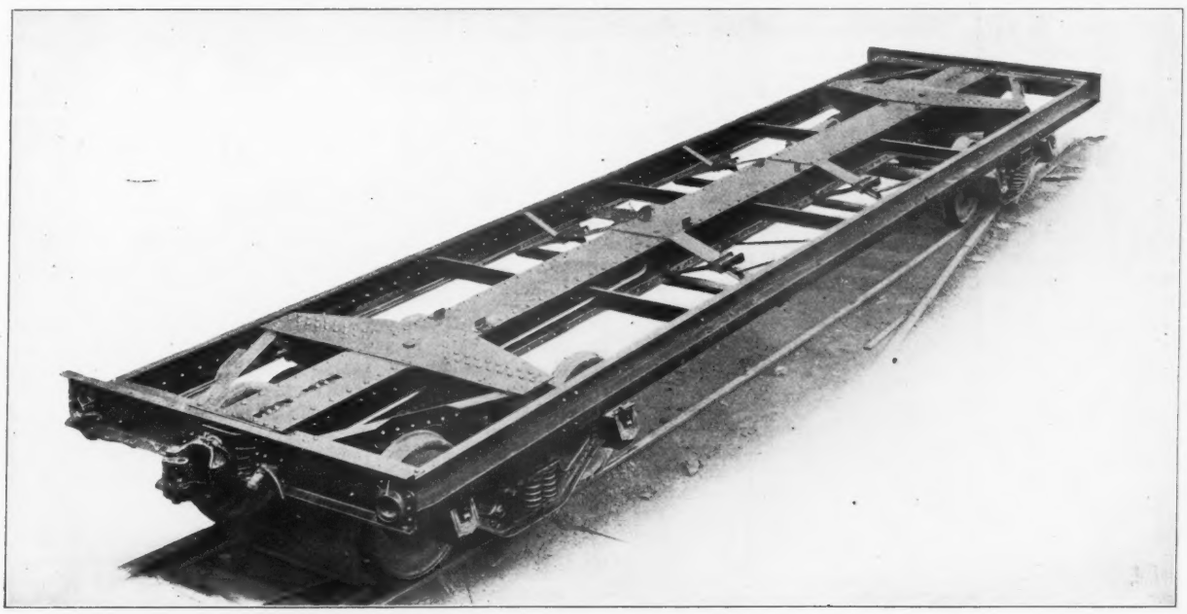
Right to Sue Under Elkins Act.—The Attorney-General of the United States has authority to institute proceedings to restrain rebating by interstate carriers on his own motion and is not required to await direction or investigation by the Interstate Commerce Commission. United States vs. Milwaukee Refrigerator Transit Co., 145 Federal Rep. 1,007.

Steel Underframe Stock Cars for the Central of New Jersey.

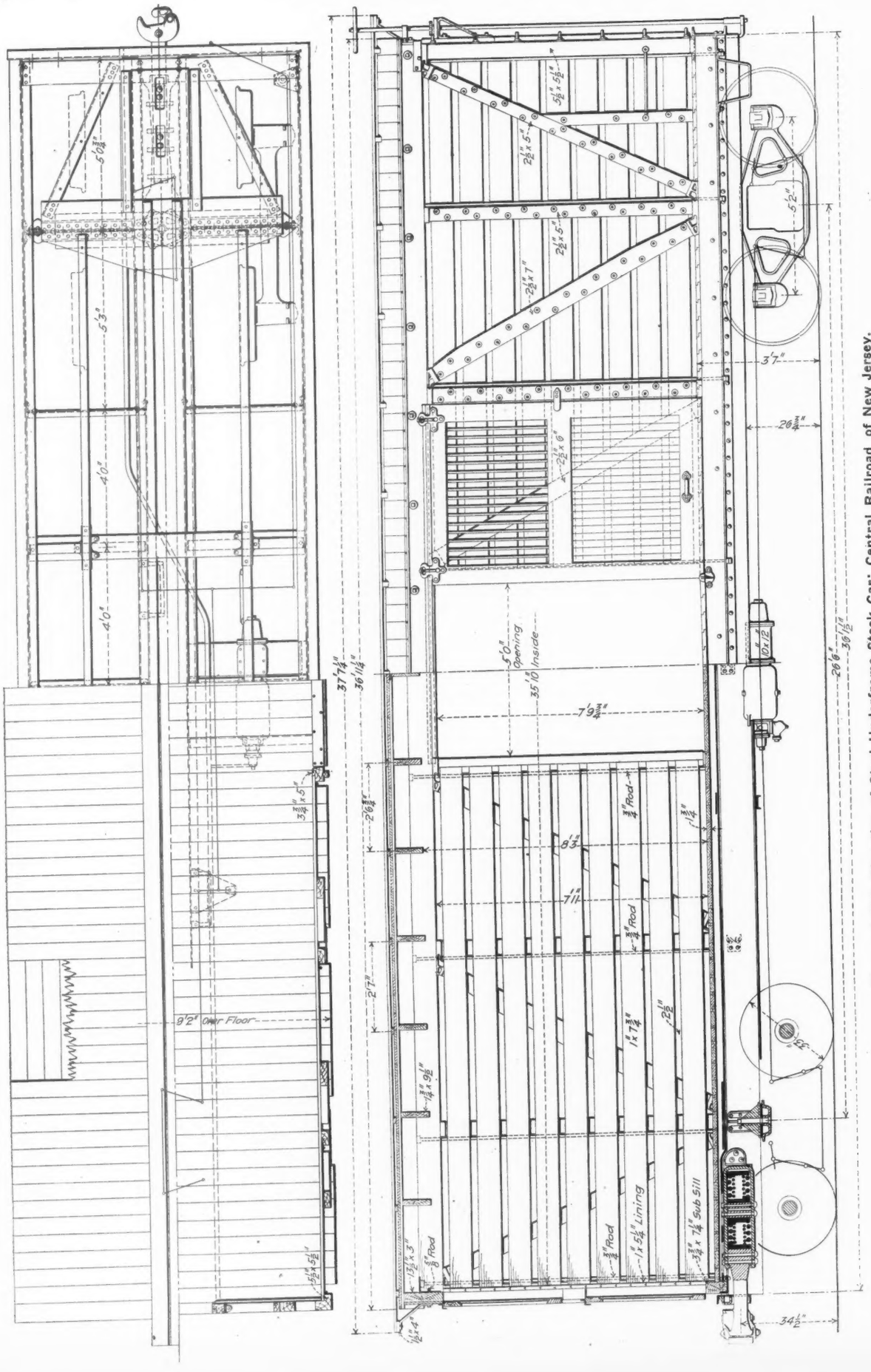
The Central Railroad of New Jersey has recently received from the Middletown Car Works 50 steel underframe stock cars of 60,000 lbs. capacity. They have low floors, 3 ft. 7 in. from top of rail,



Steel Underframe Stock Car; Central Railroad of New Jersey.



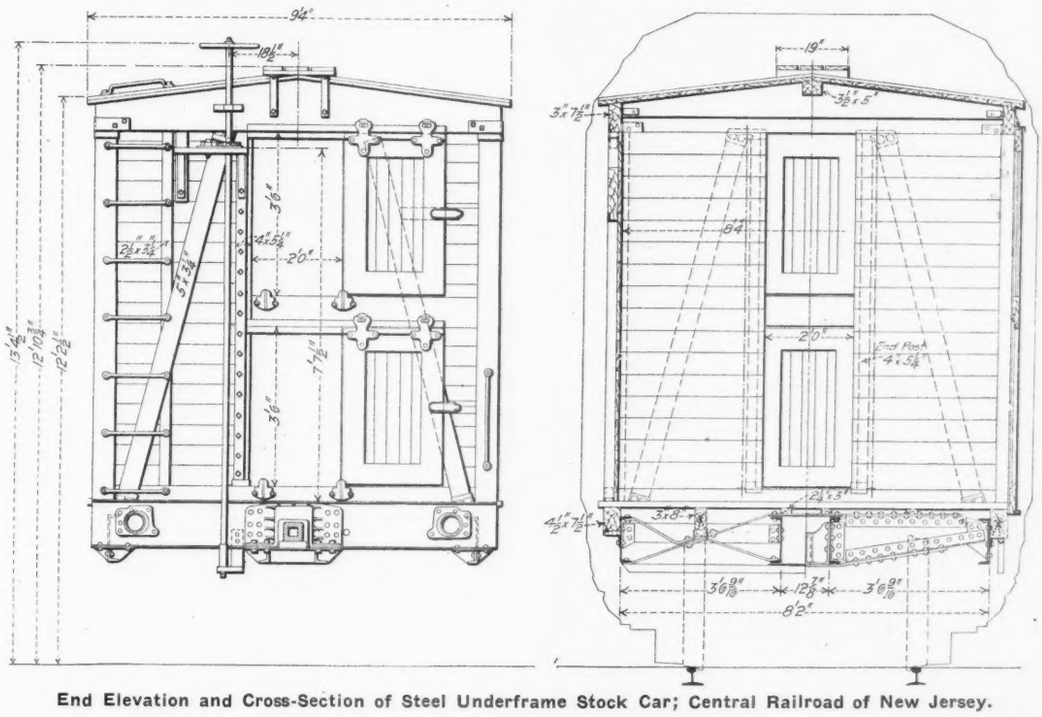
Underframe for 60,000-lbs. Capacity Stock Car; Central Railroad of New Jersey.



Plan and Side Elevation of Steel Underframe Stock Car; Central Railroad of New Jersey.

double end doors for loading lumber and 5 ft. side doors. The inside dimensions are 35 ft. 10 in. long, 8 ft. 3 in. high and 8 ft. 4 in. wide. The underframe consists of a central box girder made up of two 12-in., 20 5-lb. channels spaced 12⅞ in. apart with ⅜-in. top and bottom cover plates; similar channels for side sills and end sills, with built-up plate web bolsters. The central girder is designed to carry in addition to its normal load any excess load between bolsters which the side sills cannot carry. This excess load is transmitted by two cross trusses and three channel ties, the cross trusses also serving as supports for the intermediate floor nailing strips. One of the illustrations shows clearly the construction of the underframe. The side nailing strips are bolted to a continuous angle 4 in. x 3 in. x 5-16 in., which is riveted to the web of the side sills and gives them some small additional strength and vertical stiffness. The cars are mounted on Bettendorf cast steel trucks.

We are indebted to Mr. George I. King, Vice-President of the Middletown Car Works, for the illustrations.



End Elevation and Cross-Section of Steel Underframe Stock Car; Central Railroad of New Jersey.

Foreign Railroad Notes.

The municipal authorities of Osaka, Japan, have decided to build an electric street railway system, estimated to cost $10,000,000.

The London Motor Omnibus Co., according to its report, during the past year had a gross revenue of $400,000 and paid 10 per cent. dividends. The company operates 38 cars on a working profit of $22 each a week.

The management of the Swiss State Railroads recommends to Parliament that beginning with 1907 the time of workmen in the shops be reduced to 54 hours a week, without decrease in wages, and further that for men who have been employed ten years continuously a vacation of six days yearly be granted, for which the usual wages be allowed.

The Siemens-Schuckert electrical works of Berlin jointly with Swiss works at Oerlikon offer to equip the St. Gotthard Railroad for operation by electricity in connection with the northern outlet of that railroad from Lucerne to Zurich, and in 1909, when the railroad is to be taken over by the state, to undertake the whole traction service, receiving for their pay what the steam service has cost, until the state is ready to purchase the electrical equipment on terms to be agreed upon later.

The manager of a Berlin business which made many shipments by railroad presented some boxes of cigars to certain state railroad employees with whom the firm had dealings in forwarding or receiving goods. These employees reported the presents to their superiors, regarding them as intended to influence them in the discharge of their duties. These superior officers then prosecuted the firm for insulting the employees. The accused protested that it had no idea of influencing the men in their duties, and only gave the cigars as an acknowledgment of courteous treatment. The court, however, imposed a fine of $15, remarking that it seemed not to be as well known as it ought to be that public employees may not receive any presents for performing their duties, even when no bribery is contemplated. The acceptance of a present renders the employee liable to punishment.

The Prussian Minister of Railways has decided to discharge all female ticket sellers as they quarrel so frequently with the employees of the stronger sex, and their quarrels so often end in an attack of nerves that the situation has become intolerable. As a compensation for this loss of employment the women are to be transferred to the telephone service.

The Atlantic City Disaster.

The cause of the derailment on the drawbridge of the West Jersey & Seashore, at Atlantic City, N. J., October 28, when a train of three passenger cars tumbled off the right hand side of a deck drawbridge, causing the death of 56 persons (55 passengers and the motorman of the train), has been decided by the coroner's jury to be the misplacement of the rail, and the main paragraph of the verdict is given below.

The main facts, reported in the *Railroad Gazette* last week, are substantially as there given, except that the signals are electro-pneumatic, controlled from a mechanical interlocking machine, and that the bridge has no pneumatic apparatus. It is opened and closed by manual power, an attendant and an assistant being on duty day and night, though vessel movements through the draw are few and far between. The draw span is 110 ft. 4 in. long. The rails of the track are 33 ft. long. At the ends each rail rests on the draw for 30 ft. and on the fixed span for 3 ft. and the end of the rail on the shore has a 45 degree miter joint. The end on the draw is fastened by the usual splice bars and the end on the shore is lifted when the bridge is to be opened. Alongside the miter joint, outside of the rail, is a railshoe 5 ft. long, to carry the wheels over the joint without jar. The shoe is supported in a heavy angle iron trough, which also forms a guide for the rail.

Entering the drawspan from the fixed span the rail is found resting in a guide consisting of a bottom plate 16 in. wide supporting two longitudinal angles 3½ in. x 3½ in., one each side of the rail, fitting closely against its base. The first guide (for the right hand or outside rail) is 1 ft. 9¾ in. long; then there is a space 9 in. long, then another guide 10 in. long; then a space of 3 ft. 6 in., then a guide 10 in., then a space 3 ft., and finally a guide 12 ft. 4 in. long, this last one having at the outside of the rail a third angle with the horizontal member at the top and level with the top of the rail, to brace it against any outward thrust of the wheels. The guides are fastened to every tie, the ties being 16 in. apart, center to center.

This right hand rail, resting 3 ft. on the fixed span, was found

to have been pushed to the left (inward), as though a wheel or wheels had gone off the track to the right of it, and it was a little bent in the first 10 ft. of its length; and yet the witnesses say that the first guide was not disturbed. The other guides, including the long one, were found so much broken that nothing could be learned from their appearance to afford any light as to the course of the wheels over them, or whether anything but the wheels came in contact with them. The few eyewitnesses agree that the leading car of the train was the first to go off the track. Its trucks are reported as having been found intact, but the cowcatcher is broken and a part of it is missing. The missing part is supposed to be in the bottom of the river. The car ran some 100 ft. before it climbed the outside guard timber. This timber is 6 in. x 8 in. notched 1½ in. over the ties and bolted to every third tie. There are no inside guard rails. The displaced rail was not distorted in its surface, nor were there any marks on either its upper or its lower surface.

The bridge lock is of the well-known type in which the unlocking of the bridge and lifting of the track rails so that they will clear the guides on the fixed span are done simultaneously by means of a capstan, working through a worm gear and bell cranks. In locking the turning of the capstan simultaneously pushes wedges between the bridge and the shore support, and lowers the rails into the shore guides. The capstan and cranks must complete their movement before the signal levers in the cabin (which is on the fixed span on the Atlantic City side of the draw), are released so as to permit the signalman to set the signals to permit a train to proceed.

The occurrence of a derailment like this will give rise to the query why the interlocking of the signals was not made to depend not only on the bridge being in place, but also on the rails being secure. To this the Pennsylvania officers, having tried both methods, reply that they have deliberately employed the watchman instead of adopting the additional mechanical complication. The chance of a watchman's introducing danger by making a wrong move or by omitting any move, is believed to be less than the chance of a disarrangement of mechanical parts which shall escape detection and lead to the display of a false clear signal, as has been known to occur.

On Wednesday, November 7, the jury listened to the testimony of James M. Whitman, a mechanical engineer who was called in by the Coroner and who had examined the cars and bridge, and after deliberating several hours brought in a verdict finding that the derailment was caused by "the northwest end of the southwest rail on the draw of the bridge being out of its proper position, due, we believe, to the neglect or oversight of the man in charge of the draw." The jury then "strongly recommends that the men employed to operate the drawbridge inspect both ends of the draw before the signal is given for trains to pass the opening ends of the draw." Mr. Whitman testified that a mark which he had found on the motor box of the truck (whether the front or rear truck is not stated) was made by the end of the displaced rail; and that measurements made by him convinced him that there could be no mistake in this conclusion. Certain marks found on the cowcatcher also were made by the protruding rail, Mr. Whitman believes.

There was testimony that Bridge-tender Stewart had had an angry discussion with the captain of the vessel which had passed through the draw a short time before the accident, and the jurymen believe that this may have caused Stewart to be inattentive to his duty. The theory accepted by the jury, based on Mr. Whitman's testimony, appears to be that the rail projected upward far enough to strike the cowcatcher (normally 4½ in. above the rail), and was by that blow further displaced so as to leave it in a position to strike the motor box.

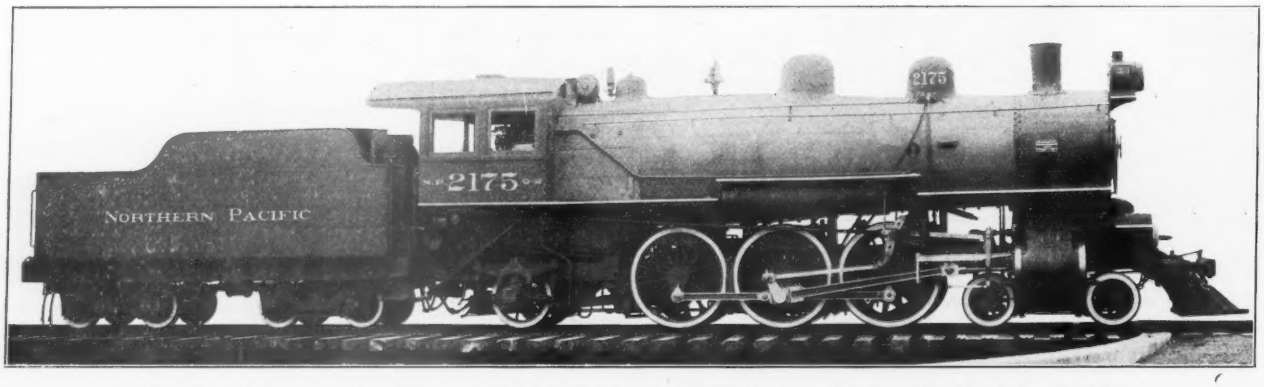
The Coroner's Jury is composed of State Senator Edward S. Lee, who was chairman of Committee on Railroads in the last New Jersey Legislature; Isaac Bacharach, Samuel P. Headley, William Ashmead, Charles Roesch, Jr., and David R. Barrett, City Assessor.

Heavy Pacific Type Locomotive for the Northern Pacific.

The American Locomotive Co. has recently completed its 40,000th locomotive at its Schenectady Works. The engine, forming one of an order of two, is of the Pacific (4-6-2) type, and is intended for passenger service on the Northern Pacific. It has a number of interesting features and its completion was marked by a special trip of a number of representatives of the technical press to Schenectady as guests of Mr. Geo. M. Basford, of the company. The party spent the day at the works and inspected the locomotive.

The locomotive is of the Cole four-cylinder balanced compound type, with cylinders 16½ in. and 27½ in. in diameter, and a common piston stroke of 26 in. The low-pressure cylinders are on the outside and the high-pressure between the frames. The high-pressure cylinders are set ahead of the low-pressure and extend well out in front of the smokebox to the front edge of the bumper. They are raised at this point and given a slight inclination downward to the rear to secure proper clearance above the front truck, a necessity that has not previously arisen in the case of the other four-cylinder compounds that have been built by this company. Previous engines of this class have had larger driving wheels, so that the cylinders when raised to the height of the wheel centers could still be kept in a horizontal position and be high enough to clear the truck. In this locomotive the driving wheels are but 69 in. in diameter, which brings the cylinders so low that they will not clear the truck, carried on wheels of 33½ in. diameter, without the raising and tilting to an inclination of about one in sixteen.

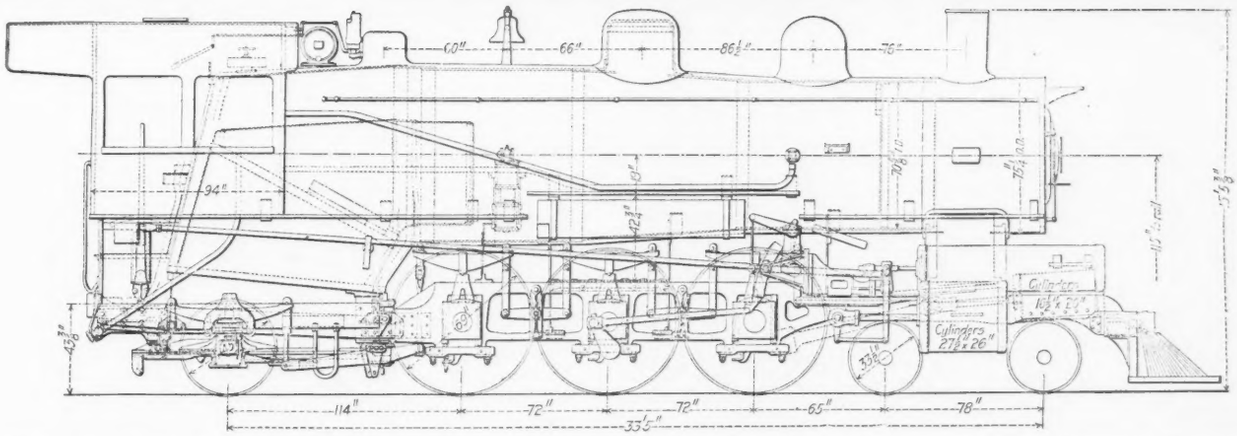
The high-pressure cylinders were set ahead of the low-pressure cylinders 3 ft. 10 in. to obtain a sufficient distance ahead of the front driving axle to use a straight one-piece connecting rod, and not a bifurcated one, straddling the front axle and reaching to the second axle. By this arrangement a length of 91¼ in. was obtained for the high-pressure main rod, that of the low-pressure being 112½ in. If the four cylinders had been located in the same transverse plane, it would have necessitated an increase of from 30 in. to 36 in. between their centers and that of the front driving axle in order to have obtained a suitable length for the high-pressure rod. This would have involved a similar increase in the length of the boiler and tubes, whereas with the design, as worked out, there was no radical change in the wheel base and boiler from other engines of the same class on the road. The front of the boiler was simply extended and the flues kept the same length as in the simple Pacific engines, but the center line of the low-pressure cylinders was set 12 in. farther from the front drivers.



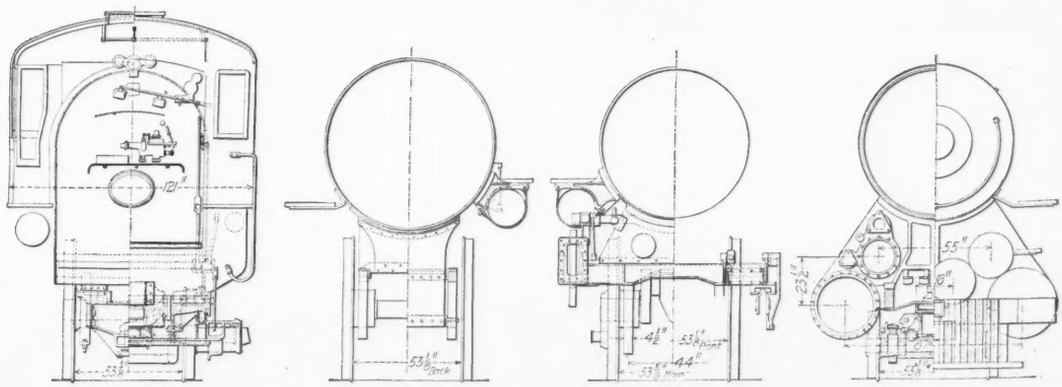
Cole Four-Cylinder Balanced Compound Pacific (4-6-2) Type Locomotive for the Northern Pacific.

The crossheads are of the Vogt type with top bearings, and the crank axle for the front drivers is forged of high carbon steel. It was made by Krupp and is of the form and dimensions shown in the engravings. The boiler presents the novel feature of the use of a combustion chamber as compared with current practice on other roads. On the Northern Pacific, however, such satisfactory results have been obtained by the use of the combustion chamber, in reducing boiler troubles, that the design has been adopted on all recent engines. The experience obtained with this class of boiler has shown that there is a great reduction of tube leakage when their ends are removed some distance from the hottest part of the fire. In addition to this, the combustion chamber gives ample opportunity to work the ends of the tubes without removing the brick arch.

As far as evaporative efficiency is concerned, engines with the combustion chamber steam equally as well as those without it. The increase of firebox heating surface is, therefore, apparently fully equivalent to the loss of tube heating surface occasioned by the necessary reduction of length. In this case the tubes have a length of 16 ft. 9 in. and the combustion chamber a depth of 3 ft. ½ in. This experience seems to corroborate the soundness of the



Side Elevation of Cole Four-Cylinder Balanced Compound Pacific (4-6-2) Locomotive. Built by the American Locomotive Company for the Northern Pacific.



End Elevations and Cross-Sections.

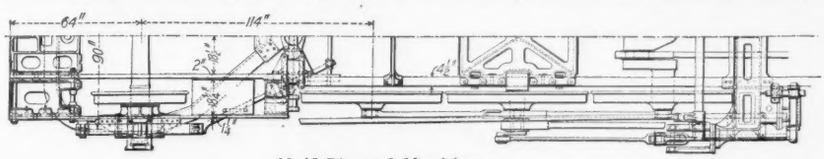
claim of Mr. H. H. Vaughan in his formula regarding the relative value of firebox and tube heating surfaces. According to this formula

$$h = \frac{H}{\sqrt{l}}$$

in which

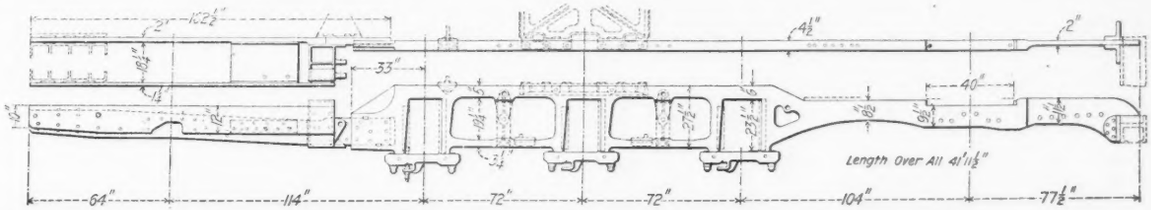
h = the tube heating surface as equated for firebox heating surface.
H = tube heating surface in sq. ft.
l = tube length in feet.

In the engine under consideration the tube heating surface is 2,667 sq. ft., and, as equated for firebox heating surface, according to the Vaughan formula, it is equivalent to 652.08 sq. ft. of fire-

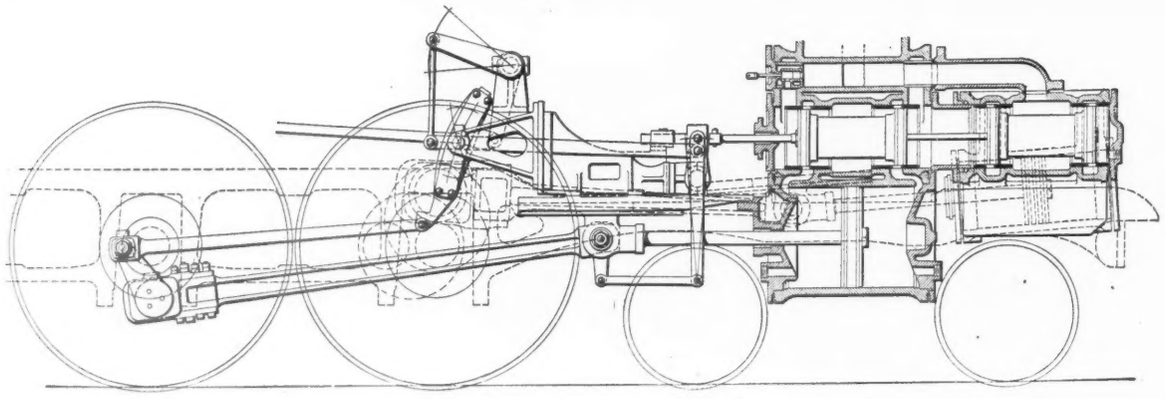


Half Plan of Machinery.

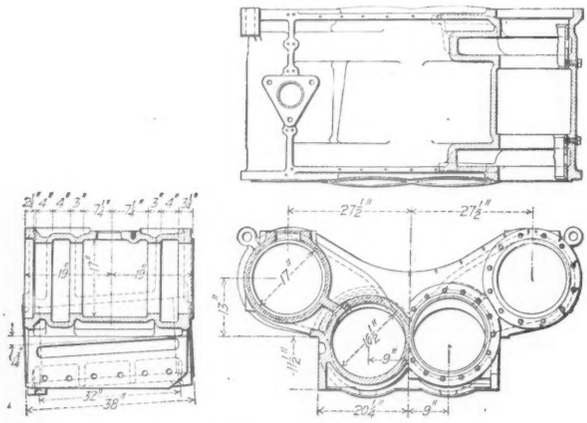
box surface. If the tubes had added to their length the depth of the combustion chamber, their total heating surface would be 3,147 sq. ft. At present the total firebox heating surface is 241.8 sq. ft., of which 61.5 sq. ft. is in the combustion chamber. According to the Vaughan formula the 160 extra square feet of heating surface that would have been gained in the tubes by extending them to the back of the combustion chamber, is equivalent to 56 sq. ft., showing that the present arrangement should be the more efficient of the two. In making this calculation the revised length of the tubes is taken at 19 ft. 9 in., and the result shows the falling off in tube efficiency per foot of length as the total length is increased. The use of the crank axle and the crowded condition between the frames necessitated the use of the Walschaert valve gear. It is driven from an eccentric crank on the low-pressure crank pin, and, as will be seen by a reference to the plan, it works in a straight line from the crank pin to the rocker. It was impossible to carry it forward in the same line to the valve stem because of the necessity of setting the valve stem in, in order to use one stem for the two valves of the high and low-pressure cylinders on each side, the arrangement of which is clearly shown by the illustration of the valve motion. The steam chests are horizontal and parallel to the low-pressure cylinder, and the space between the valves serves as the receiver. The valves are of the piston type and of the same diameter; that of the high-pressure cylinder being arranged for inside admission and that of the low-pressure for outside admission. The low-pressure cylinders are cast with half saddles, while the high-pressure cylinders are cast with their steam chests in one piece. The frames are in one piece from the splice of the rear frame back of the rear driving pedestal to the front bumper with a deep single rail at the front of the full width of the main frame (4½ in.) to a point just in front of the low-pressure cylinder seat where it is narrowed to 2 in. At this point the high-pressure cylinder is bolted on each side with six 1⅜-in. bolts. These cylinders thus form a cross-tie between the frames. The frame is exceptionally rigid in cross bracing. Starting at the forward end there is the front bumper, then comes the high-pressure cylinders and then the low-pressure cylinders. Back of this in the clear space left between the frames is a system of stiff cross bracing. Immediately back of the low-pressure cylinders there is a steel casting that serves not only as a cross-tie for the frames but as a support for



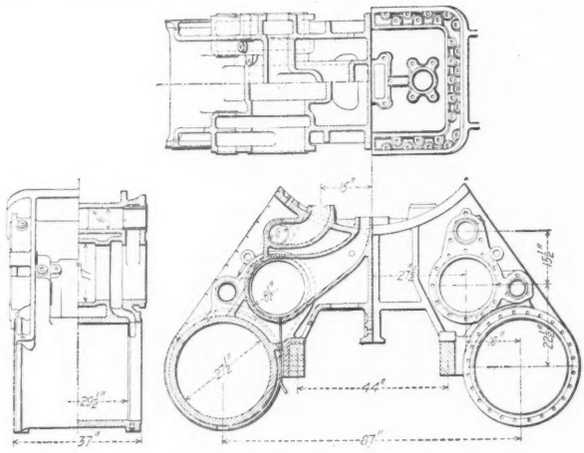
Frame for Four-Cylinder Balanced Compound Locomotive; Northern Pacific.



Arrangement of Walschaert Valve Gear.



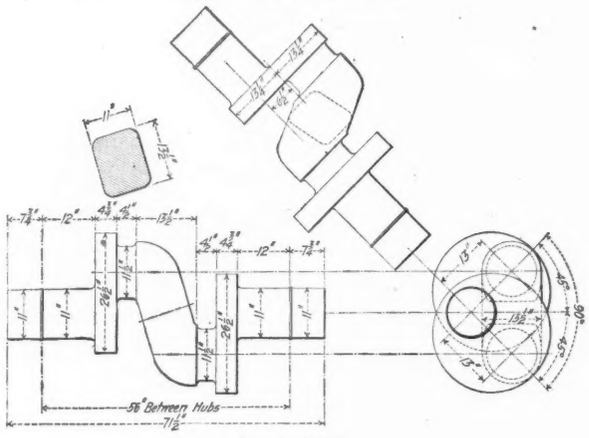
High Pressure Cylinders.



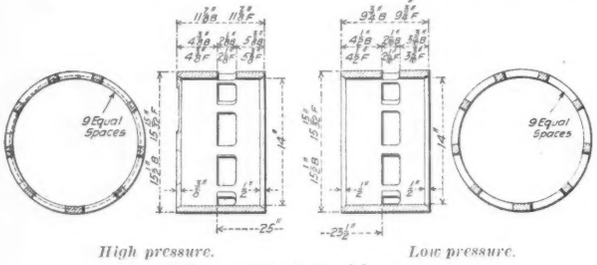
Low Pressure Cylinders.

the guides of both high and low-pressure crossheads, and a fastening for the rocker boxes, reverse shaft box and link bearing. Back of this again, and in line with the second driving axle is another broad open cross-tie shown in the plan. Then comes a cross-tie to which the waist buckle plate is attached. The lower rail of the frame is also cross-braced between the wheels. The front of the firebox rests on expansion pads while the back end is carried by the usual buckle plate. Finally the frame is held at the rear in the ordinary manner by the deck plate. It will thus be seen that the frame is well provided with cross-bracing throughout its whole length, and that with braces of such width that it will be almost impossible for any yielding to occur.

The use of a four-cylinder balanced compound locomotive for heavy passenger service on the Northern Pacific marks another step in advance in the introduction of this type of locomotive and a recognition of its especial adaptability for this class of work. This is particularly emphasized by the fact that by the elimina-

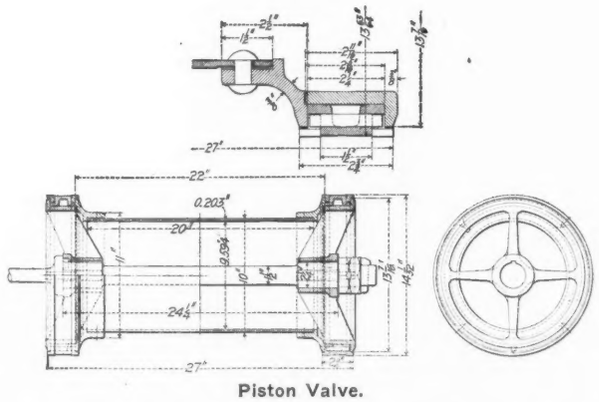


Crank Axle.



High pressure. *Low pressure.*

Steam Chest Bushings.

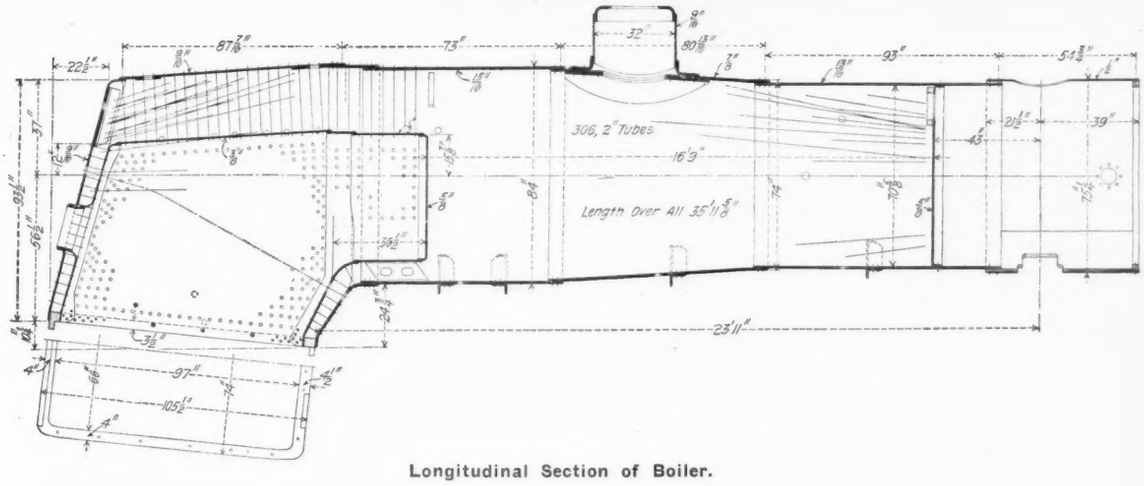


Piston Valve.

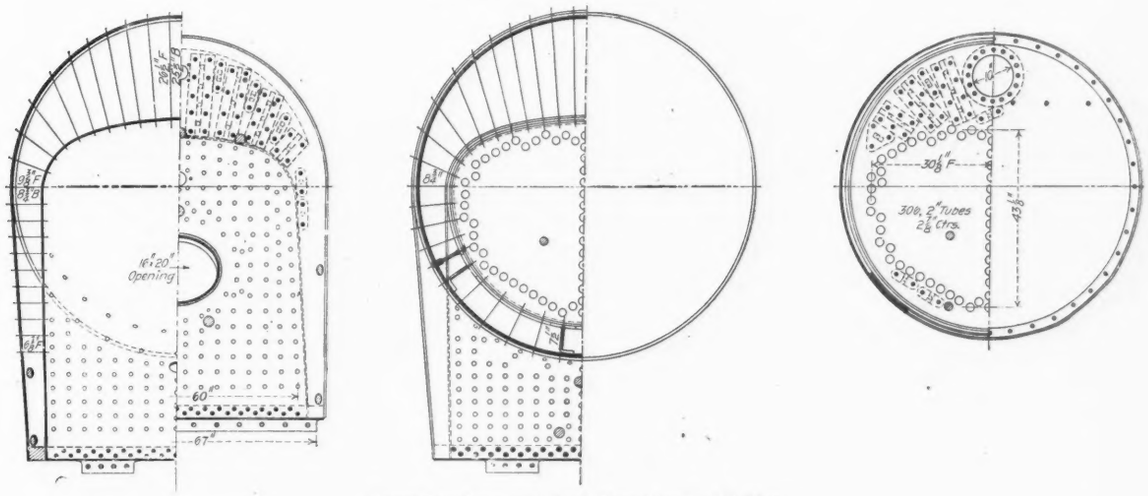
tion of the hammer-blow an increase in weight of 11,000 lbs. on the driving wheels over that permitted with the simple engine of the same class has been allowed.

Another advantage that it is expected will be gained is the sustained development of a higher horse-power without an increase in the size of the boiler. This expectation is based on tests made with a balanced compound locomotive on the New York Central, in which it was shown that with identically the same size of boiler the compound engines developed from 20 to 30 per cent. higher horse-power on a sustained run than the original simple engine. In actual service the compounds developed 1,688 indicated horse-power at 67 miles an hour and 1,980 horse-power at 75 miles an hour, while the simple engine developed only from 1,400 to 1,500 horse-power.

This type of locomotive has not been in service long enough in this country to have developed all of its good or bad qualities, nor have we, as yet, any thorough information as to the life and cost of maintenance, but from what has been done and the records



Longitudinal Section of Boiler.



Cross-Sections and End Elevations of Boiler.

of foreign roads it is coming to be looked upon as the probable type for future heavy fast passenger work.

The following are some of the principal dimensions of this new Pacific engine for the Northern Pacific:

Cylinder diameter, H. P.	16½ in.
Cylinder diameter L. P.	27½ "
Piston stroke	26 "
Wheel base, driving	12 ft.
" total	33 ft. 5 in.
" engine and tender	62 " 10 "
Weight in working order	240,000 lbs.
" on drivers	157,000 "
" engine and tender	380,500 "
Heating surface, tubes	2,667.0 sq. ft.
" " firebox	232.9 "
" " arch tubes	8.9 "
" " total	2,908.8 "
Grate area	43.5 "
Axles, diameter, main driving journal	11 in.
" length main driving journal	11½ "
" diameter, other driving journals	9½ "
" length, other driving journals	12 "
" diameter, trailing truck journal	8 "
" length trailing truck journals	14 "
" diameter engine truck journals	6½ "
" length, engine truck journal	12 "
Boiler, type	Extension wagon-top.
Boiler, diameter, first ring outside	72½ in.
Steam pressure	220 lbs.
Firebox, length	96 in.
" width	65¼ "
" thickness, crown side and back sheets	5/8 "
" thickness tube sheet	5/8 "
" water space, front	4½ "
" water space, sides and back	4 "
" crown staying	Radial
Tubes, number	306
" diameter	2 in.
" length	16 ft. 9
Exhaust nozzle	Single
Exhaust nozzle, diameter	5⅜ in., 5⅝ in. and 5⅞ in.
Smokestack, diameter	18 in. and 20 7/16 "
Tank, water capacity	7,000 gals.
Tank, coal capacity	12 tons.
Valves, travel	6 in.
" steam lap	1 in.
" exhaust clearance, H. P.	1/16 "
" exhaust clearance, L. P.	1/8 "
" lead	1/4 "
Wheels, diameter drivers	69 "
" " front trucks	33½ "
" " trailing truck	45 "
" " tender	33½ "
Ratio of high to low pressure cylinders	1 to 2.78
Tractive power	30,340 lbs.

$$\frac{\text{Weight on drivers}}{\text{Tractive power}} = 5.21$$

$$\frac{\text{Total weight}}{\text{Tractive power}} = 7.81$$

$$\frac{\text{Tractive power x diameter drivers}}{\text{Heating surface}} = 719.70$$

Equivalent firebox htg. surf. (Vaughan formula), 893.88 sq. ft.

$$\frac{\text{Heating surface}}{\text{Grate area}} = 66.87$$

$$\frac{\text{Firebox heating surface}}{\text{Total heating surface}} = .083$$

$$\frac{\text{Weight on drivers}}{\text{Heating surface}} = 53.97$$

$$\frac{\text{Total weight}}{\text{Heating surface}} = 82.51$$

Volume 2 H. P. cylinders, 3.21 cu. ft.

$$\frac{\text{Heating surface}}{\text{Vol 2 H. P. cylinders}} = 906.17$$

$$\frac{\text{Grate area}}{\text{Vol 2 H. P. cylinders}} = 13.55$$

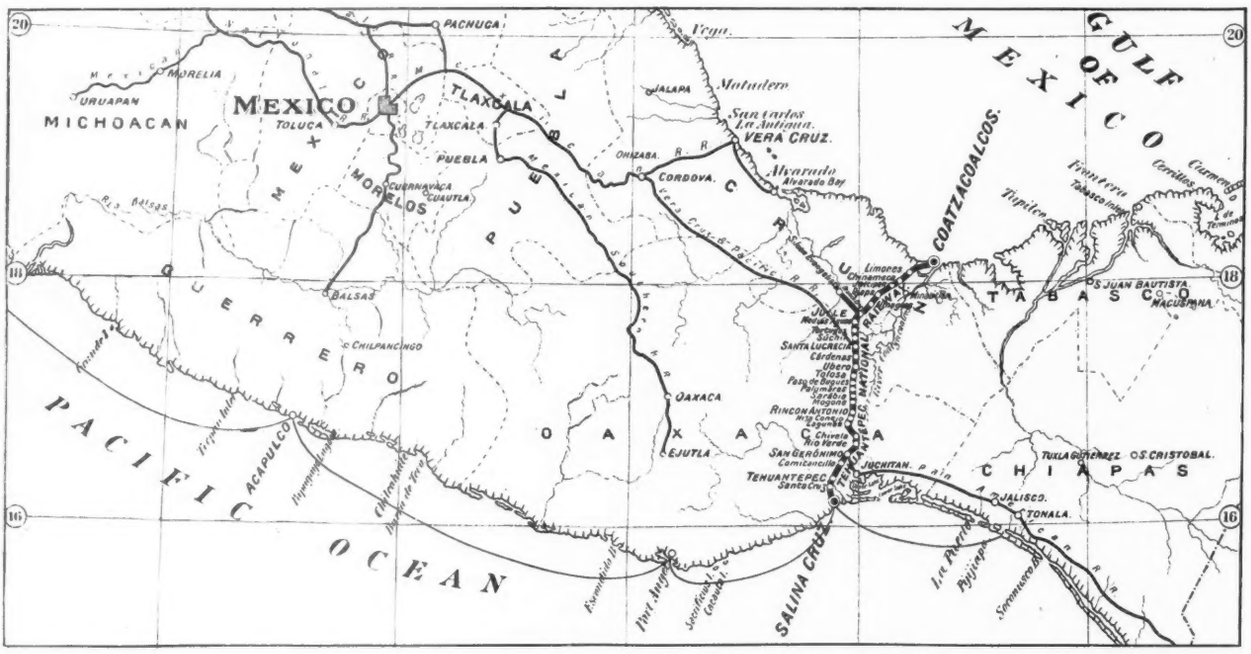
In the construction of the engine cast steel is used for the axle boxes and wheel centers in addition to those parts already mentioned. It is equipped with the Westinghouse-American driver, truck and engine brakes.

A company has been incorporated in Natal, South Africa, to build a large iron and steel mill at Vryheid, to mine coal at Hlobane, and build a railroad 37 miles long. The road is to cost about $1,000,000 and is to be operated by the government. The concession given to the new company provides that it shall spend $1,250,000 on the iron mills and sell coal to the Government at $1.25 per ton.

The Tehuantepec National Railway.

While the type of canal to be adopted at Panama has only lately been decided upon, and its completion will probably require from eight to ten years, the Tehuantepec National Railway, which is to accomplish, though in another way, the same results commercially as the Panama Canal, is now almost ready to be put in complete operation for through traffic. In the *Railroad Gazette* of July 15, 1904, E. L. Corthell, who had himself been associated with a similar project, described the long and interesting history of the attempt to make a satisfactory line of communication across the Tehuantepec isthmus. The project was commented on editorially in our issue of July 28, 1905, at the time when the announcement was made that the American-Hawaiian Steamship Company had concluded a contract with the Tehuantepec National Railway for operation of connecting steamship lines on both the Pacific and Atlantic oceans. Through the courtesy of S. Pearson & Son, Limited, of London, joint lessees with the Mexican Government of the road, we are enabled to present late facts in regard to the present state of the route and two new official maps of the railroad and its connections.

The Tehuantepec National is 189 miles long and runs from Coatzacoalcos, on the Gulf of Mexico, south across the Isthmus to the Pacific port of Salina Cruz. The present contract on which the firm of S. Pearson & Son, Limited, is now engaged has involved the entire reconstruction of the railroad from end to end, in order to put it in shape for heavy traffic, and the construction of notable harbor works at each of the two terminals. The railroad had previously been built piecemeal across the Isthmus and was of poor construction, entirely unsuited to heavy traffic.



The Tehuantepec National Railway, Showing Railroad Connections.

The line as reconstructed has been improved throughout. Gradients have been reduced to a maximum of 1.6 per cent., compensated, and curvature to a maximum of 11 deg. 40 min. The line rises gradually from the Atlantic terminus, reaching a maximum elevation above sea level of 855 feet at Niza Conejo, and thence drops quickly to sea level again at the Pacific at Salina Cruz. The rails, originally 56-lb., have been replaced by 80-lb. rails of the Am. Soc. of C. E. section. Ties are spaced 13 to 14 to a 30-foot rail length. Some ties are native hardwood, but most of them are creosoted American pine or California red wood, with Lewis tie plates. Two-thirds of the road is ballasted with crushed rock 12 to 1 in. deep, the remainder with gravel. There is only one short tunnel on the line. There are, however, a number of bridges, all of the recent ones having been designed for consolidation engines with 44,000 lbs. on the driving axles and train loads of 4,000 lbs. per foot. One of the largest bridges is at San Lucretia, 9 miles from the Atlantic terminus, where the Vera Cruz & Pacific joins the Tehuantepec line. It is over the Jaltepec river. This is a five-span steel lattice girder, Pratt type bridge 560 ft. long, with masonry abutments. Most of the more important bridges are of this type, though the plate girder type is also used. The smaller bridges are built with lattice half through girders and the smallest of all with plate deck girders. Culverts on the northern end of the line are concrete; on the central and southern parts, masonry. The number of bridge openings was originally 838, spanned mostly by timber structures. By filling up trestles and replacing small bridges with culverts the number of bridge openings has been reduced to 257, all of which have iron or steel superstructures. Both consolidation and 10-wheel locomotives are largely in use, and all engines are being fitted, if not originally so designed, for the use of oil fuel. At present, most of the oil is imported from Texas, but it is planned to use the mineral oil found on the Isthmus, which is now being exploited and developed.

The headquarters of the road are at Rincon Antonio, a new town 125 miles from the Atlantic and 68 miles from the Pacific terminus. Here large new buildings have been built for the use of the staff and employees. The road includes a 16-mile branch running to San Juan Evangelista. Over the Vera Cruz & Pacific there is connection with the railroads of Mexico and the United States. One problem which has made difficult the operation and reconstruction of the road is the rapid growth of the tropical vegetation. Instead of going to the expense of removing the growth every few weeks, the company has made use of a chemical compound which permanently destroys it. This effects a saving of about $12,000 a year. The roots of the plants as well as the growth above ground are completely killed by this chemical, which is applied hot in liquid form from a tank car which is heated by coiled steam pipes and the chemical spread by steam pressure through an atomizer.

In the reduction of grades and curvature some heavy construction work was done. The line passes through several gorges or canyons where deep rock cutting and steep embankment work were necessary; for instance, 10 miles in the Malatango canyon and 24 miles in the Chivla Pass, the latter the highest land between the two oceans. Here the track is in two horseshoe curves and there is the only tunnel on the line. Here also the maximum gradients and curvature for the rest of the line are exceeded, the grade rising to 2.7 per cent. and the curvature to a maximum of 21 degrees 40 minutes.

Hardly second to the large amount of work necessary on the line of the railroad has been the improvement of the two harbors. The plan provides for a depth of water at the terminal wharves in each ocean of 32 ft. 9 in. at low water. At Coatzacoalcos on the Atlantic side the Coatzacoalcos river empties into the ocean, and through the silt and debris which is brought down, the bar at the mouth of the river between the extensive deep basin inside and the deep water outside normally had about 14 feet of water on its crest. The channel was deepened to 32 ft. 9 in., but a rise in the river in two weeks shoaled the channel to 14 feet. In order to make and keep the channel clear two permanent jetties of stone and concrete blocks are being built, converging from a width of 3,445 ft. at the shores to 919 ft. at the sea ends. By means of these jetties it is expected that the current in the river instead of spreading out and forming a bar will be confined in a narrower channel and wash the silt out into the deep water beyond. The railroad terminal at this point includes wharves extending for 3,640 ft. along the west bank of the river, of structural steel, supported by 6-inch solid steel piles

decked with timber. Behind the wharves are five sheds 400 ft. by 110 ft. The wharves are equipped with 12 electric cranes of 3 tons capacity and electric capstans for handling cars, together with railroad tracks leading out to the railroad. Five of the wharves are now ready and fully equipped. The training walls are nearly finished. There is already plenty of deep water in the river and alongside the wharves and there is soon to be 30 ft. over the bar at the mouth of the river.

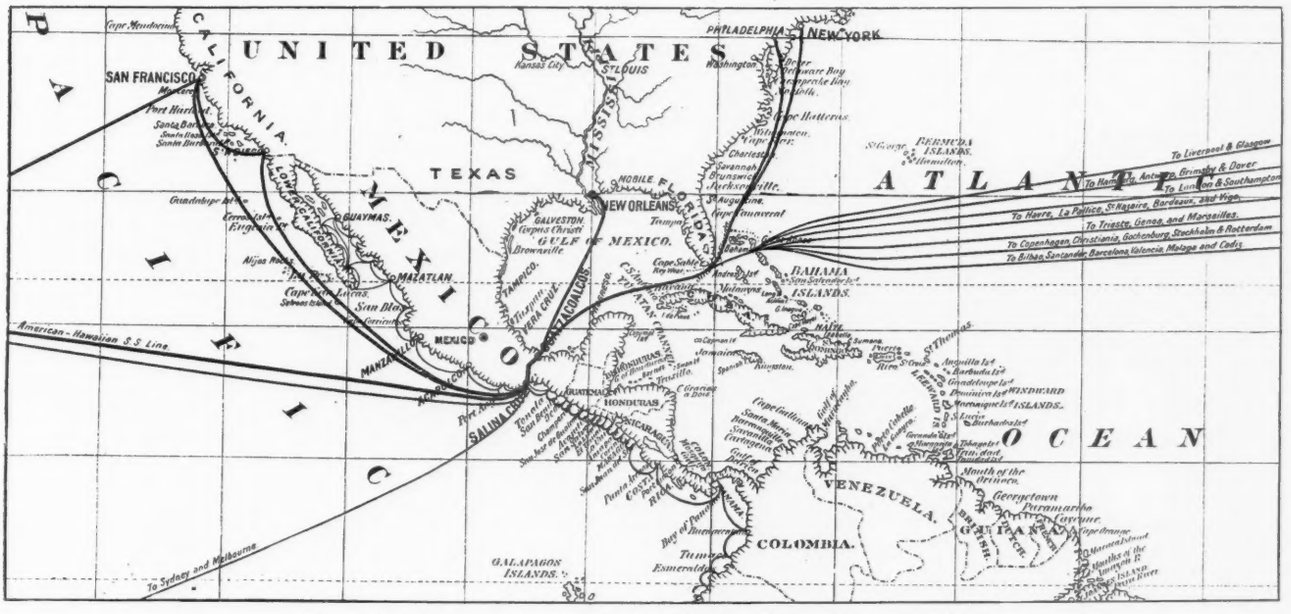
Salina Cruz, instead of being at the mouth of a river, is open to the waves of the Pacific. A long curved shore line with, on the west, a promontory of porphyry rock 245 ft. high jutting out into the sea, has been used as a brace to which to tie a breakwater made out of the rock of the bluff. The stone blasted off has been used as the foundation of a massive work formed of huge concrete blocks put in place by a powerful Titan crane which moves on the completed work. As the water deepens rapidly, the dike will rest at its end in about 59 ft. of water. A similar dike is being built on the east side and when completed there will be an entrance about 650 ft. wide between the two. The east jetty is built by carrying the materials along the shore from the promontory and depositing them by a second Titan crane. These two massive breakwaters, thrown out like giant protecting arms into the sea, will form the outer harbor, or harbor of refuge. The east breakwater is to be five-eighths of a mile long and the west breakwater about 1,900 ft. long. The largest quarry block yet handled for the breakwaters weighs 56½ metric tons. The real harbor will be an inner basin which will be reached by a passage from the outer harbor and in which there will be still water. This harbor will be wholly artificial, occupying on the shore the former site of the old town of Salina Cruz. Excavation of the inner basin is being done by two dredges, one having a 24-in. and the other two 20-in. centrifugal pumps by which sand is pumped into hoppers on the boats which then go out to sea and dump it in deep water. The basin will be about 3,280 ft. long by 728 ft. wide, with 32 ft. 9 in. depth of water at low tide. The entrance, which will be in the dividing wall for passage of ships from the outer harbor to the inner basin, will be 98 ft. wide and will be spanned by two swing bridges. On each side of the entrance three warehouses will be built and tracks will be laid on the wharves for handling freight between rail and ship, assisted by traveling electric cranes. Vessels are to moor alongside the wharf within the basin. The wharves are on the south side of the enclosed tidal basin, the quay wall being formed of concrete monoliths sunk in place and coped with granite. This quay has sheds, electric cranes and capstans similar to the equipment of the wharves at Coatzacoalcos. On the opposite side of the basin a graving dock 590 ft. long and 98 ft. wide by 31 ft. deep is in course of construction. At Salina Cruz, berths for two 12,000-ton steamers are now ready and further wharfage accommodations will soon be available. The harbor works at both these terminals are now far enough advanced to permit the largest ocean-going steamers with perfect safety in all weathers to discharge alongside the wharves direct into cars or warehouses. At both terminals accommodations can be increased almost indefinitely.

The following steamship lines already call regularly at Coalzacoalcos and Salina Cruz: Compania Mexicana de Navegacion, Cia. Nevira de Pacifico, Cuban Steamship Line, Pacific Mail and Cosma Steamship Company. When the two terminal harbors are opened for interoceanic traffic the America-Hawaiian Line will divide its steamers now running between New York and Hawaii via the straits of Magellan into two fleets, one giving regular service between Hawaii, San Francisco and Salina Cruz on the Pacific and the other a weekly service on the Atlantic between New York and Coatzacoalcos. In addition, all steamship lines now running from Europe to Mexico plan to give direct service to Coatzacoalcos and steamship connections are to be established at Salina Cruz with all the Pacific Coast ports of Central and South America as far south as Valparaiso. As indicating the saving in distance which can be effected by use of the Tehuantepec route, the following table is given:

Distances in Nautical Miles.

		Via Tehuantepec.	Via Panama.
New York	to San Francisco	4,226	5,495
	Acapulco	2,363	3,613
	Mazatlan	3,017	4,055
	Yokohama	8,666	9,835
	Honolulu	5,699	6,688
New Orleans	to San Francisco	3,091	4,700
	Acapulco	1,262	2,861
	Mazatlan	1,759	3,458
Liverpool	to San Francisco	7,182	8,038
	Acapulco	5,274	6,035
	Honolulu	8,511	9,263
	Yokohama	11,478	12,500

This shows that the average saving in distance by the Tehuantepec route over Panama to all points on the Atlantic Coast of the United States and Europe is about 1,250 miles. The ordinary freight steamer makes about 250 miles a day, which would mean five days longer via Panama, assuming the time of crossing the two isthmuses to be the same. To pass through the Panama canal will probably take a steamer about a day, while it is expected to send freight across the Tehuantepec isthmus from ship to ship in two days. This would leave four days to the advantage of Tehuantepec.



The Tehuantepec National Railway, Showing Steamship Connections.

The project is being carried on under a partnership contract extending for 51 years from July 1, 1902, between the Mexican Government and S. Pearson & Son, Limited, of London. The contractors are the managers of the company's affairs. The working capital is to be furnished in equal shares by the two parties to the contract. The surplus earnings after payment of all expenses, fixed charges and losses is to be divisible between the government and the contractors as follows: During the first 36 years, 65 per cent. to the Government and 35 per cent. to the contractors, with slightly increased percentages going to the Government during the remainder of the contract. At the close of the 51-year period the property is turned over to the Mexican Government. In May the Mexican Congress passed a law authorizing an increased expenditure of $12,250,000 to be used in completion of the port works at Coatzacoalcos. Extracts from the law are as follows:

"Article 1. The Executive of the Union is empowered to take $5,000,000 from the treasury reserves, and a sum not exceeding $2,000,000 from the surplus to be obtained in the current fiscal year of 1905-1906, for the exclusive purpose of paying the cost of the works which are being executed at the ports of Salina Cruz

and Coatzacoalcos, in accordance with the contract promulgated on January 24, 1900.

"Art. 2. The Executive is also empowered to emit, in the course of the fiscal years 1906-1907, 1907-1908 and 1908-1909, interest bearing treasury notes, running for not more than two years. The proceeds of these notes will be devoted to the payment of the works referred to in the foregoing article.

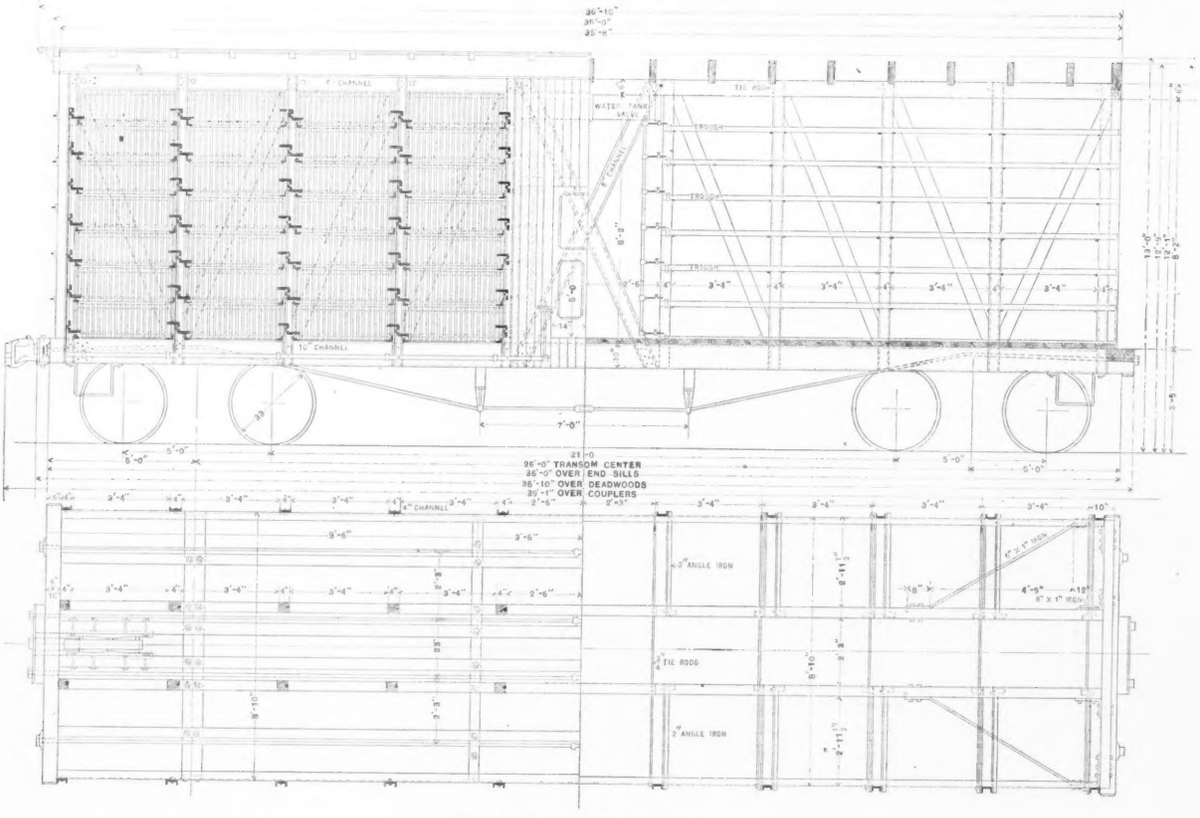
"Art. 3. On no account shall there be issued in one and the same fiscal year more than $4,000,000 of treasury notes, and the amount of those emitted in the years 1906-1907, 1907-1908 and 1908-1909, according to the second article of this law, shall not exceed $5,250,000.

The total cost of the port works at Coatzacoalcos and Salina Cruz is estimated at $65,000,000. About $35,000,000 has already been spent, leaving $30,000,000 still to be provided for. To provide this sum in the most convenient manner is the object of the bill.

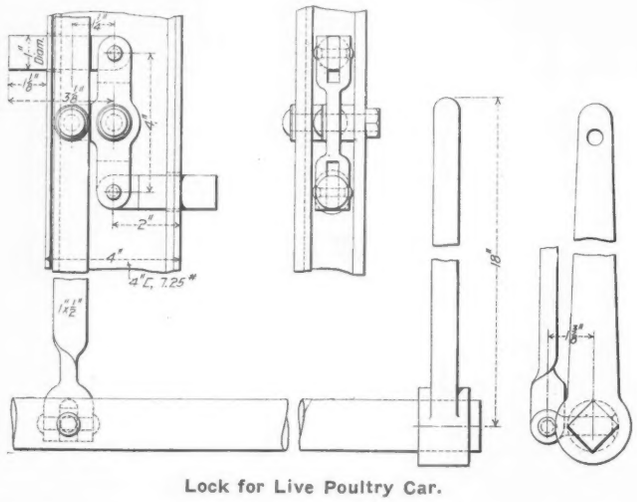
The management of the railroads of Alsace-Lorraine, which are the property of the German Empire, has notified its employees that it regards two associations (socialistic) of railroad employees, known as the "Railroaders of Germany" and the "South German Railroad Union," as hostile to public order, and that membership or support of either will be considered incompatible with service on the Imperial railroads, and will be cause for dismissal from the service. In the place where this notice was first posted, where there are railroad shops, one of these organizations is said to have 900 members.

A New Live Poultry Car.

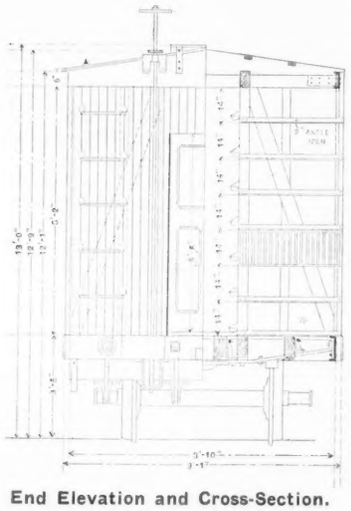
A new kind of live poultry car is illustrated by the accompanying drawings. To permit the coops to be inserted and withdrawn from the outside, the side frame bracing is transferred to a position at the back of the coops over the intermediate sill next the center sill. The side posts are 4-in. channels riveted to channel iron side sills and plates and the coops slide on angle irons riveted to these posts. Additional strength is given the side frame by an X brace of channel irons riveted to the side sill and plate in the space ordinarily occupied by the door opening. The car has a center aisle 27 in. wide and end doors the width of the aisle and 6 ft. high. Small side doors, 5 ft. high and 28 in. wide, are also put there in front of the X braces, as a matter of convenience. The car holds 112 coops, giving it a capacity of 6,720 chickens.



Bundy Live Poultry Car.



Lock for Live Poultry Car.



End Elevation and Cross-Section.

The coops are locked in place by a special locking device, a drawing of which is shown. All of the locks on one side of the car are thrown by a single lever at the middle of the car lengthways. The principal advantages of the coop arrangement are the ease with which it can be removed and cleaned and replaced, thus making it easy to keep the coops and the car in sanitary condition. There are troughs on the aisle side of the coops and overhead is a water tank with pipes to the troughs for watering the poultry in transit. The car was designed by Mr. C. L. Bundy, Superintendent of the coach department of the Hicks Locomotive & Car Works, Chicago Heights, Ill.

Experimental Roadbed on the Pennsylvania.

About a year ago on the suggestion of President Cassatt a committee of engineering officers of the Pennsylvania Railroad was appointed to prepare plans for a proposed standard roadbed section that would be perfectly drained, amply ballasted and present a neat and pleasing appearance to travelers on passing trains. Four short stretches of track on the main line were rebuilt last summer in accordance with the plans submitted by this committee. One five-mile section is near Lancaster on the Philadelphia division and another is near Newport in the Middle division. One section 2½ miles long is near Cresson on the Pittsburg division and a similar section is near Hillside about 50 miles east of Pittsburg. The accompanying illustrations show the appearance of this track in rock and earth cuts. The ditch on each side is 10 ft. 6 in. wide with the bottom 3 ft. 6 in. below the level of the top of the ties. This gives a decided slope away from the ballast and provides a waterway large enough to carry off any heavy rain. The ditch is not paved or sodded, but sprinkling with crude oil has been tried in places to keep down dust and weeds. The banks above the ditch are sodded to prevent washing down. In building these experimental sections, about 5,000 cu. yds. of additional ballast per mile were required to raise the tracks and provide better drainage. The greatest expenditure, however, was in cutting down the slopes and sodding the banks, which amounted to about 60 per cent. of the whole cost of the improvement.

Pennsylvania Experimental Roadbed in Earth Cut.

Pennsylvania Experimental Roadbed in Rock Cut.

The Pennsylvania's 50-Year Dividend Record.

The dividend of 3½ per cent. on the Pennsylvania stock declared November 1, marks a jubilee anniversary in the completion of 50 years of consecutive dividends. Since dividends were first begun in 1856 the company has made the remarkable record of never having failed to pay a cash dividend for each semi-annual period. The dividend of 3½ per cent. is on $305,794,500 stock and amounts to $10,702,807. The first dividend in May, 1856, of 4 per cent., was on $10,886,004, and amounted to $435,440. In addition to the cash dividends the Pennsylvania has at irregular intervals beginning May, 1864, declared scrip dividends in twelve different years. The largest dividend of this kind was 30 per cent. in 1864, when 10 per cent. in cash was also paid. In those days the rates received for transportation were very high, and railroads largely followed the policy of paying out profits as they were earned. The total scrip dividends aggregate $25,512,139 par value. The lowest rate of cash dividend paid in any one year was 3½ per cent. in 1877. The total cash dividends paid by the Pennsylvania aggregate $269,116,854. The total cash and scrip dividends together are $294,628,993, an amount nearly equalling the present capital stock.

Stock allotments, conferring valuable rights to stockholders, have been a feature of the company's operations, in raising new capital for improvements. There have been numerous such allotments, covering the last 42 years, but the greatest were in 1901 and 1903, these allotments being of 33⅓ per cent. in par value to $50,500,800 and $75,094,750 respectively. The outstanding stock of the company from 1856 to 1864 was less than $14,000,000. During this period the dividend ranged from 6 to 10 per cent. Up to 1872 the capital stock had not reached $50,000,000, and the semi-annual dividend disbursements did not exceed $2,000,000. Between 1875 and 1880 the rate dropped to 4 per cent. per year for most of the time. By 1888, the capital stock outstanding had reached $106,545,400, and by 1893 it was $129,245,800. At this latter figure the dividend remained at 5 per cent. per year for seven years. Then, in 1900, an extra dividend of 1 per cent. was declared, followed 18 months later by the establishment of the dividend on a regular basis of 6 per cent. per year, which has since been maintained up to to-day.

The rate of the semi-annual cash dividends declared, the amount of capital stock outstanding and the dividend disbursement each six months since May, 1892, when 6 per cent. per annum was being paid, is shown below:

	Capital.	Rate.	Disbursed.
May, 1892	$126,774,050	3	$3,803,221
November, 1892	126,774,500	3	3,803,235
May, 1893	126,774,500	2½	3,169,362
November, 1893	129,245,800	2½	3,231,145
May, 1894	129,289,000	2½	3,232,225
November, 1894	129,296,900	2½	3,232,422
May, 1895	129,299,750	2½	3,232,493
November, 1895	129,300,700	2½	3,232,517
May, 1896	120,301,850	2½	3,232,546
November, 1896	129,303,050	2½	3,232,546
May, 1897	129,303,250	2½	3,232,581
November, 1897	129,303,550	2½	3,232,588
May, 1898	129,304,550	2½	3,232,613
November, 1898	129,304,900	2½	3,232,622
May, 1899	129,305,200	2½	3,232,630
November, 1899	129,305,450	2½	3,232,636
May, 1900	139,186,100	2½	3,479,652
November, 1900	151,471,950	2½*	5,301,518
May, 1901	151,502,400	2½	3,787,560
November, 1901	202,003,200	2½*	7,070,112
May, 1902	200,374,850	3	6,131,245
November, 1902	204,374,850	3	6,131,245
May, 1903	204,380,950	3	6,131,428
November, 1903	288,716,750	3	8,661,502
May, 1904	296,483,550	3	8,894,506
November, 1904	301,284,250	3	9,038,527
May, 1905	301,285,250	3	9,038,578
November, 1905	302,513,300	3	9,075,399
May, 1906	305,210,000	3	9,156,300
November, 1906	305,794,500	3½	10,702,807

*And 1 per cent. —*Wall Street Journal.*

The Wurtemberg State Railroads contemplate a new schedule of wages for shop hands revised as follows: The management prepares

a tentative schedule, a copy of which is sent to every member of the committees representing the different classes of workmen. At the meeting of each of these committees when they consider this schedule a representative of the management will be present. The final schedule will be issued after considering the reports of all these committees.

Balanced Compound Prairie Type Locomotives for the Atchison, Topeka & Santa Fe.

The Baldwin Locomotive Works has recently delivered to the Atchison, Topeka & Santa Fe 56 four-cylinder balanced compound Prairie (2-6-2) type locomotives, which are the heaviest six-coupled locomotives ever turned out by the builders. They have a tractive power of 37,840 lbs. when working compound. As the weight on the driving wheels is 174,700 lbs. the factor of adhesion is 4.61. The distribution of weight on the truck wheels is not excessive, but the driving axle loads are very high, 58,233 lbs. The use of the four-cylinder compound system of balancing makes possible the use of a weight on each driving axle, which, a few years ago, would have been considered quite unsafe. These locomotives are intended for fast freight service on a part of the Santa Fe having 10 degree curves, and with grades from .6 per cent to 1.25 per cent. Heretofore the balanced compound has been considered as exclusively a type for passenger service, chiefly because the perfect balancing obtained made possible high speeds and greater adhesive weight per axle. Th application of the principle to locomotives for fast freight service is novel, but entirely in line with the demand for quick transportation of perishable commodities. The growing traffic in fruits and Oriental imports from California has resulted in the adoption of through freight schedules by the transcontinental roads, which to-day exceed in average speed the passenger schedules of a few years ago. These locomotives, with their large boilers and ample cylinder dimensions, will be able to handle these fast through freights in better time and with more reliability than ever before.

General Dimensions.

Wheel base, driving	13 ft. 8 in.
Wheel base, total engine	33 ft. 9 in.
Wheel base, total engine and tender	64 ft. 7½ in.
Heating surface, firebox	207.3 sq. ft.
Heating surface, tubes	3,810.5 sq. ft.
Heating surface, total	4,017.8 sq. ft.
Grate area	53.5 sq. ft.

Wheels and Journals.

Drivers, number	6
Drivers, diameter	69 in.
Truck wheels, diameter	Front 42¼ in., back 50 in.
Journals, driving axles	11 in. x 10½ in. and 10 in. x 12 in.
Journals, truck axles	6½ in. x 12 in. and 8 in. x 14 in.

Cylinders.

Cylinders, diameter	17½ in. and 29 in.
Piston, stroke	28 in.
Valves, type	Balanced piston

Boiler.

Type	Extended wagon top
Working steam pressure	225 lbs.
Diameter	76 in.
Thickness of sheets	¾ in. and 29/32 in.
Staying	Radical
Crown sheet, thickness	⅜ in.
Tube sheet, thickness	9/16 in.

Firebox.

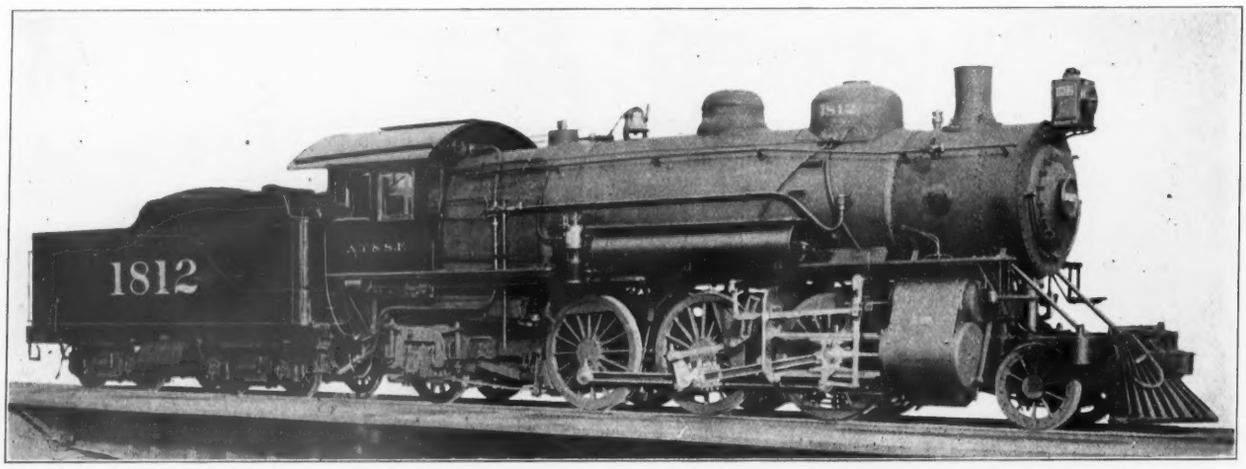
Length	108 1/16 in.
Width	71¼ in.
Depth, front	83½ in.
Depth, back	70½ in.
Thickness of sheets	¾ in.
Water space	Front 4½ in., back 4 in., sides 5 in.

Tubes.

Number	342
Material	Iron, No. 11 gage
Length	19 ft.
Diameter	2¼ in.

Tender.

Water capacity	9,000 gal.
Coal capacity	12 tons.
Wheels, diameter	34¼ in.
Journals	5½ in. x 10 in.



Baldwin Four-Cylinder Balanced Compound Prairie (2-6-2) Locomotive; Atchison, Topeka & Santa Fe.

The pistons are all coupled to the second driving axle, and the inside or high pressure cylinders are inclined at an angle of 7 degrees, so that the main rods can clear the leading driving axle. The two cranks on the same side of the engine instead of being placed 180 degrees apart, are 173 degrees apart, this arrangement being necessary in order that the pistons may start their strokes at the same instant.

The Walschaerts valve gear is applied to these engines, the valve being driven through a rock shaft having both arms pointing downwards. The bearing for this rock shaft is mounted on a cross-tie, which is supported by knees bolted to the engine frames. It is also braced to the cylinder casting. The Rushton trailing truck is used, the journals being placed outside. The spring seat is in the form of a cast steel saddle, which is suspended directly on the swing links. The spring link seat back of the truck is bolted to an outside supplemental frame, which is secured to the main frame by means of steel castings.

The boiler is of the extended wagon top, radial stay type, the front ring of the barrel being coned. It has a sloping throat and back head. The inside diameter of the dome ring is 82 in.

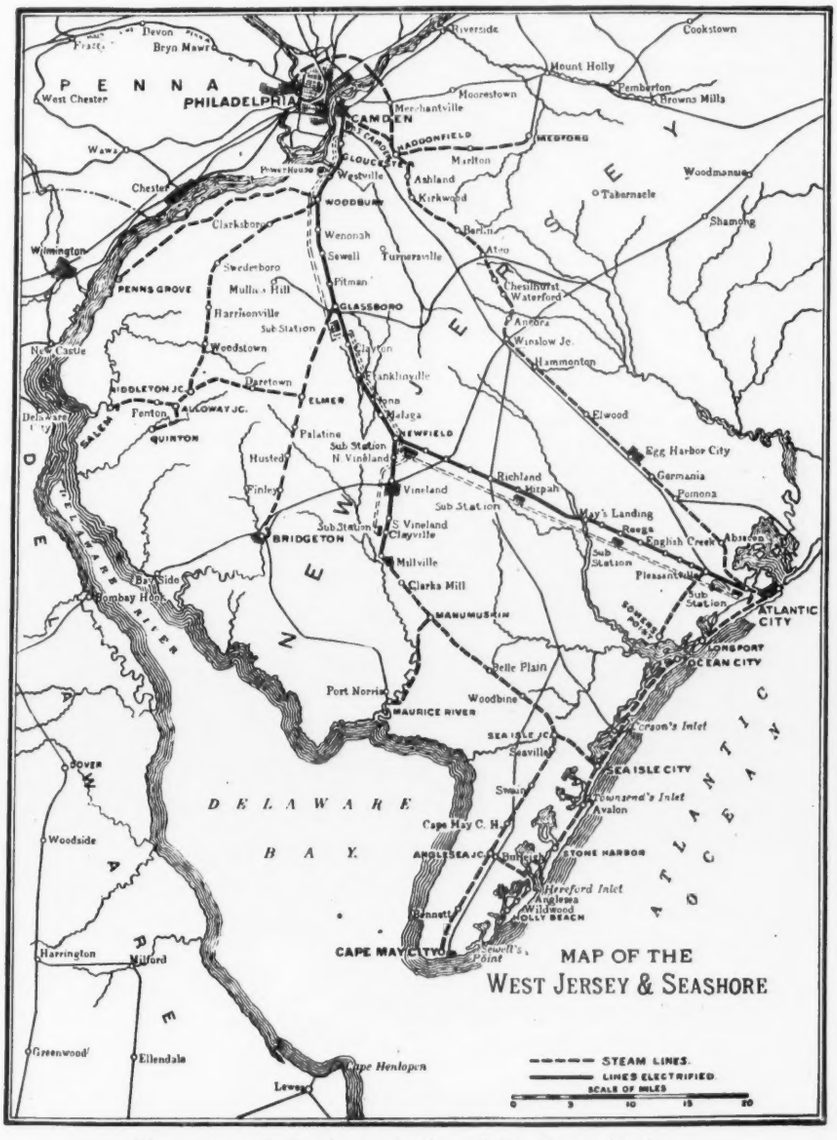
The principal dimensions are as follows:

Kind of fuel	Soft coal
Weight on drivers	174,700 lbs.
Weight on front truck	31,300 lbs.
Weight on trailing truck	42,200 lbs.
Weight, total	248,200 lbs.
Weight, engine and tender	418,000 lbs.

Front View of Four-Cylinder Balanced Compound; A. T. & S. F.

Electrification of the West Jersey & Seashore.

The electrified parts of the West Jersey & Seashore division of the Pennsylvania run from Camden, N. J., via Newfield, to Atlantic City, 65 miles, and from Newfield to Millville, 10 miles; these are shown in solid lines on the accompanying map. The Pennsylvania has two roads connecting Camden with Atlantic City; it is the longer of these routes that has been electrified. This has been done because on the longer route there is a large local traffic, which, it is believed, can be handled better by electric traction than is possible with steam. The line was opened to through traffic under electrification on September 18, and local traffic was begun on October 12. The building of the terminals and inspection sheds, double tracking, changes in existing tracks, grading, new bridges, changes in telegraph lines and installation of a special telephone system, were carried out by the Pennsylvania's regular engineering and maintenance of way departments. The interlocking plants and automatic block signals were installed by the Union Switch & Signal Company. The signal system was described in the *Railroad Gazette* of October 5. The new cars and trucks were designed by the motive power department of the road, and built by the American Car & Foundry Company, the J. G. Brill Company and the Wason Car Manufacturing Company. The entire contract for the building and equipment of the power house and sub-stations and the electrical equipment on the cars, was held by the General Electric Company, under the supervision of George Gibbs, Chief Engineer of Electric Traction. Stern & Silverman, of Philadelphia, were appointed by the General Electric Company as their general sub-contractors, and the Scofield Company, also of Philadelphia, acted as general engineers for the power house and sub-contractors for the piling and foundations.



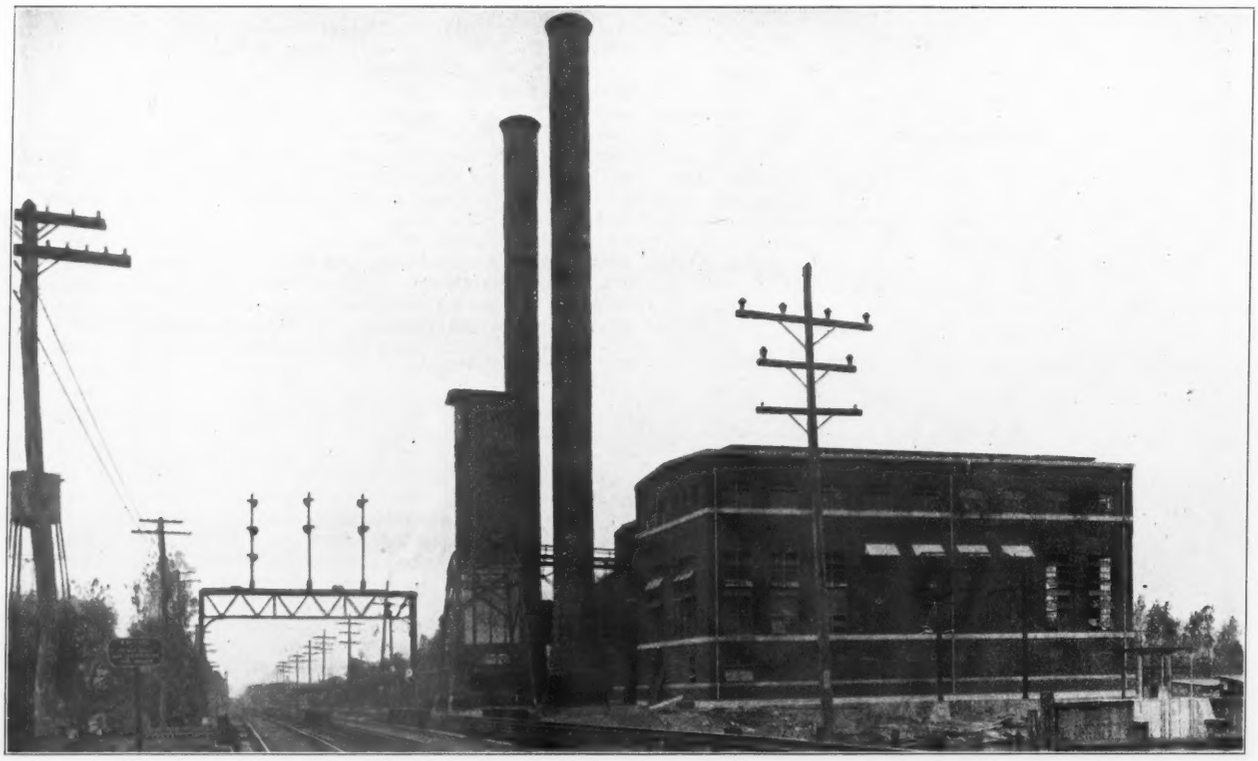
West Jersey & Seashore Division of the Pennsylvania.

The line from Camden to Atlantic City is double tracked throughout, and has three tracks between Camden and Woodbury, 8 miles. From the Camden terminal to Newfield the road is laid with 100-lb. rails of the Pennsylvania Railroad standard section, and from Newfield to Atlantic City with 85-lb. rails of the A. S. C. E. section. The line from Newfield to Millville is a single-track road, and is laid with 100-lb. rails. The power house and sub-station equipment are designed to supply enough power to operate ultimately all the cars now provided, with express service to Atlantic City, consisting of three-car trains running on 15 minute headway in each direction at a speed, on straight level track, of 60 miles an hour; a local service of two-car trains between Camden and Millville at half-hour intervals, and single cars between Camden and Woodbury at 10-minute intervals. The present schedule consists of three-car express trains between Camden and Atlantic City on one-hour intervals, the running time being 90 minutes, and a local service of two, three and four-car trains run on a minimum interval of 15 minutes during the rush hours between Camden and Glassboro, 18 miles, every fourth train going on to Millville.

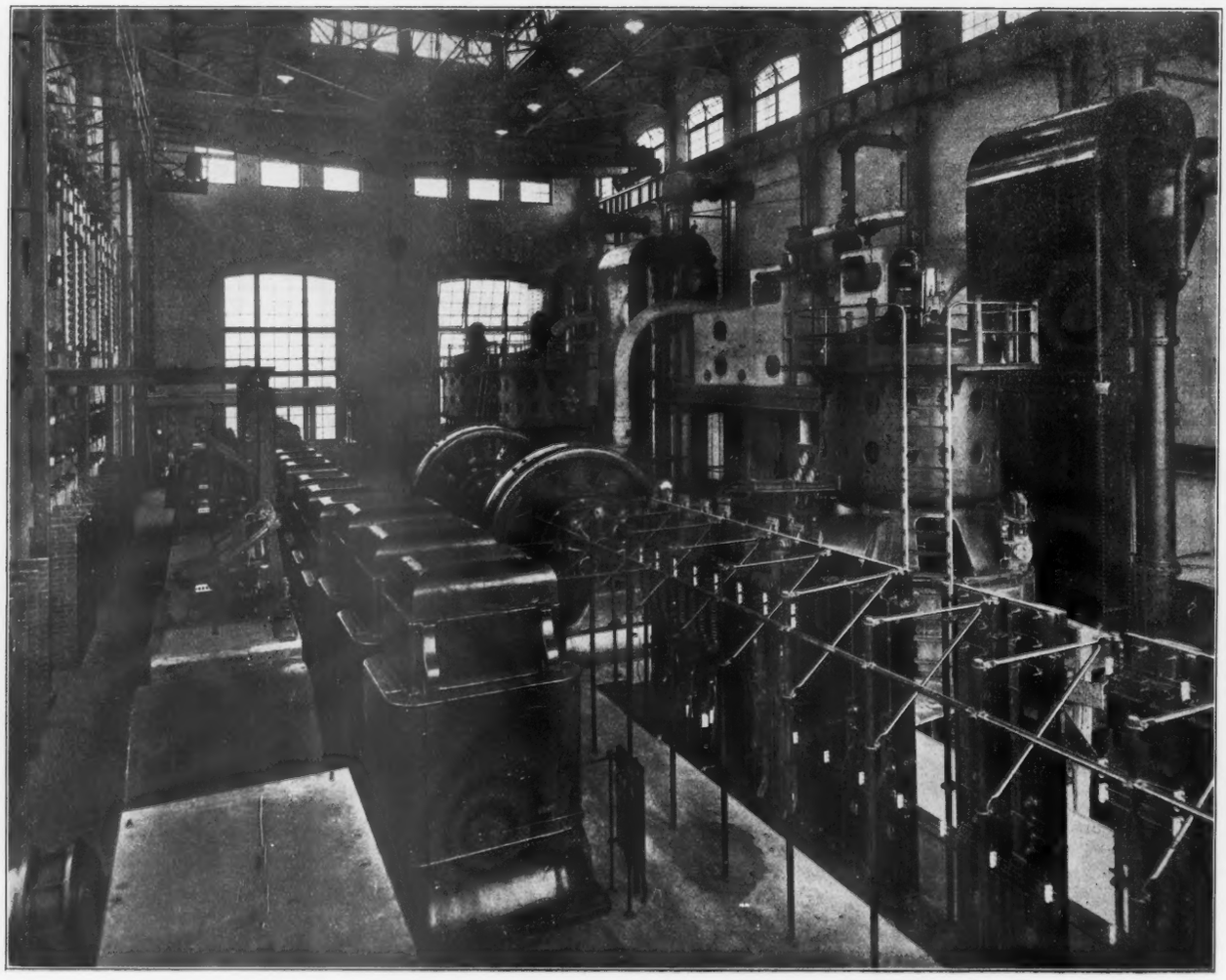
At Camden a new terminal has been built adjoining the ferry terminal. This work includes a number of stub end tracks with concrete platforms sheltered by steel umbrella sheds; three-quarters of a mile of new elevated double-track trestle, with stone piers and steel superstructure at street crossings, was built to connect this terminal with the existing lines at grade near Haddon avenue. From a point about two miles from Atlantic City a new right of way into the city was secured; after crossing the "Thoroughfare" on a new drawbridge, the tracks cross the Philadelphia & Reading on an elevated structure, consisting of nine concrete piers with steel superstructure, and enter the Atlantic City terminal on a descending grade. This terminal, of which a photograph is shown herewith, is new, and is like the one at Camden. It is south of the present steam road terminal.

The power house, interior and exterior views of which are shown in the accompanying photographs, is at Big Timber Creek, just north of Westville, six miles from the Camden terminal. This site was chosen on January 17, 1906, and work begun two days later. On July 1 two boilers and one turbine were generating power by which the first car was run. The foundations of the power house, boiler house and stacks are reinforced concrete in which are imbedded the tops of the concrete piles on which the structures rest. In the boiler house are 12 Stirling water tube boilers, each rated at 358 h.p., and fitted with superheaters. The steam is supplied at 175 lbs. pressure to three 2,000 k.w., 25-cycle, three-phase Curtis turbines which generate alternating current at 6,600 volts. This current is stepped up to 33,000 volts for transmission to the sub-stations, where it is reduced to 430 volts, and then converted through the rotary transformers into 650-volt direct current in the third rail for driving the motors. The other equipment of the power house includes two 75 k.w. 125-volt Curtis turbo-exciters and nine 700 k.w. 25-cycle air-blast transformers. The area of the power house is 17,059 sq. ft., which leaves room for a fourth turbine, when it shall be needed, to furnish additional power when heavier traffic is built up by the improved services. The foundation for this engine is already built. There are eight sub-stations, one at Westville, one at each of the terminals in South Camden, Clayville and Atlantic City, and four at intermediate stations. Each sub-station contains two rotary 750-k.w. converters, except those at Clayville and Mispah, which are of 500 k.w. capacity. The station at Atlantic City has room for two additional rotary converters of 1,000 k.w. capacity, and the other sub-stations each have room for one more 750-k.w. converter. Three air-cooled transformers are provided for use with each rotary converter. Each converter can be started, run up to full speed and be delivering power to the line within a minute. There is in each sub-station a hand crane which can handle any of the machinery in the building.

Inspection sheds have been built at the three terminals; the one at Atlantic City is illustrated herewith. The one at Camden

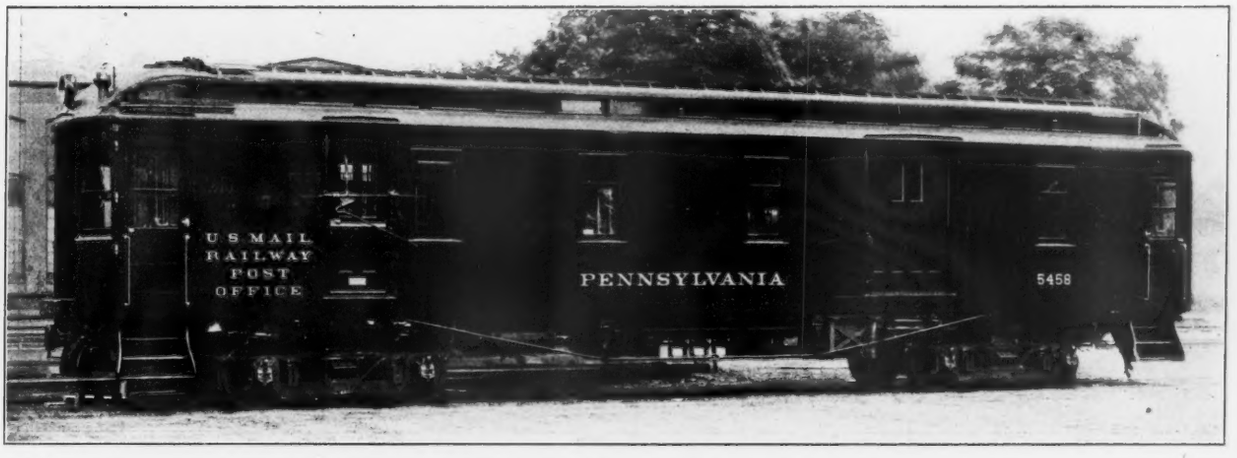


Power House at Westville, New Jersey.



Interior of Power House; West Jersey and Seashore.

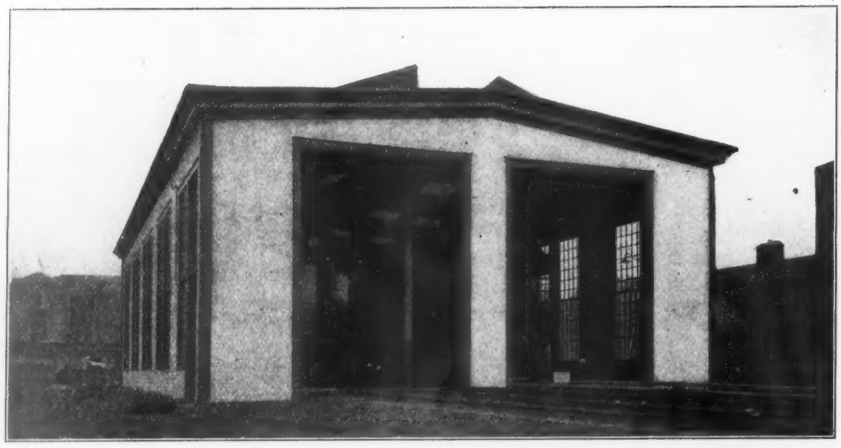
New Terminal at Atlantic City.



Baggage and Mail Motor Car; West Jersey & Seashore.

Passenger Motor Car; West Jersey & Seashore.

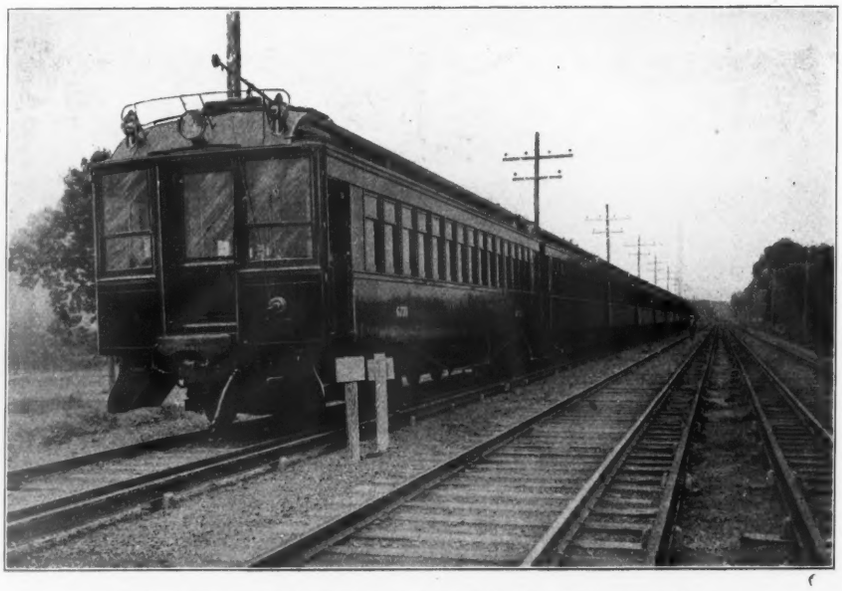
has three tracks and is 221 ft. long x 56 ft. wide, allowing room for nine cars as well as for office space, a store room and a small machine shop. Within the shed, overhead trolley instead of the third rail is used. There is a pit for each track, provided with steam heat, electric lights and compressed air outlets for cleaning. Over the center track is a hand crane on a runway extending into the machine shop. The building has a wooden frame covered with corrugated galvanized iron and there are steel rolling doors at the main entrance. Inside of the shed the track rail is carried on a stringer making the top of the rail 12 in. above the floor level; the bottom of the pit is 3 ft. 5 in. below the top of the rail. The other inspection sheds are of the same general arrangement but smaller.



Car Inspection Shed at Atlantic City.

The transmission line, 71 miles long, is double throughout. The cable consists of six No. 1 B. & S. hard drawn solid copper wires. The poles are chestnut, usually 45 ft. high and 125 ft. apart. The top arm carries four insulators and the lower arm two insulators. The insulators are made in two parts and tested to 85,000 volts. The line is protected from lightning by a galvanized steel cable $^{5}/_{16}$ in. in diameter strung along the tops of the poles 4 ft. above the nearest charged wire and grounded at every fifth pole. The third rail is of the top contact type and is 100-lb. Pennsylvania Railroad standard cross section and composition, being thus interchangeable with the track rails. The insulated supports, which are 8 ft. apart, are reconstructed granite held in position by a metal centering cup fastened to the ends of long ties with lag screws. These insulators are 10 in. long and 5½ in. broad at the base, the foot of the rail being 3½ in. above the tie. The supports are shown clearly in the photograph of the line near South Westville. The third rail is 26 in. from the track rail and 3½ in. higher; these dimensions are similar to those for the Long Island, the Interborough Rapid Transit in New York City, and the Pennsylvania's New York terminal, now under construction. The third rail is bonded with concealed ribbon bonds with solid copper terminals compressed into 1-in. drilled holes in the rails; there are two bonds for each joint. The jumpers used at

Crossing at Westville, Showing Jumpers and Cattle Guards; West Jersey & Seashore.



Track near South Westville, Showing Third Rail Support.

all grade crossings and at other places where a continuous third rail is impracticable, consist of cables laid in solid concrete and protected at the surface of the ground with terra cotta covers. They can be seen in the photograph of the Westville station. Where the tracks cross the "Thoroughfare" at Atlantic City the third rails on the draw are connected to the third rails on the approaches by sliding contact shoes, so that when the draw is closed the rail is continuously connected. Two submarine cables also connect the rails so that the opening of the draw does not interrupt the circuit. The submarine cables for the return circuit are bare.

The third rail is anchored at intervals by metal clamps secured to the under flange of the rail and engaging the insulator on either side. The third rails may be isolated from each other, but normally they are electrically connected midway between the substations to get the combined conductivity of both rails. There are also section insulators opposite each substation so that in case of accident on any part of the system only a short section would be dead. The right of way is fenced in and at all grade crossings the fence is brought into the rails as far as the metal guards which protect the crossings. At all stations and in the Atlantic City and Camden yards the third rail is protected by planks on top and on the outside, supported by ample posts 6 ft. apart. The boards are held together with angle straps, no part of which extends above or below the protecting plank. Wherever possible, the rail is kept between the tracks, and is therefore on the side of the track farthest from the station platform. Fences between the track prevent crossing. In order to prevent passengers or others on the platforms from touching the contact shoes on the platform side of the car, there is a protecting plank similar to the third rail protecting plank but carried on castings fastened to the ties. The branch line from Newfield south to Melville is a trolley line. The line wire poles are 100 ft. apart; where practicable, the transmission poles have been used to support the span wires. The trolley wire is 22 ft. from the tops of the track rails. The trolley is also used between Haddon avenue, Camden, and South Gloucester; tubular steel poles are used to support the cross wires on this stretch of track. On the Newfield-Melville line, lightning arresters are placed about 1,000 ft. apart.

All of the cars are motor cars, the equipment being the same for both types of cars. Photographs of each type are shown. For the present service 62 passenger cars and six combination baggage and mail cars have been built. The general design is that of the standard Pennsylvania Railroad coach. The general dimensions are as follows:

Length over buffers	55 ft. 5½ in.
Length over body and sills	46 " 6 "
Truck centers	33 " 0 "
Width over sheathing	9 " 10 "
Width at eaves	10 " 1¼ "
Height from top of rail to top of roof (car light)	13 " 3 15/16 "
Total weight of car, fully equipped	98,000 lbs.

The passenger cars seat 58. The entire under side of the cars is protected by transit ¼ in. thick, and above the motor truck is a steel plate over asbestos fire felt. The cars are lighted and heated by electricity, the wires being carried in galvanized iron conduits along the roof. Both motor and trailing trucks are similar to those used on the Interborough Rapid Transit and the Long Island, except that the wheel base is somewhat longer. The truck bolster and truck center plates are steel castings machined to the proper dimensions. The side frames are wrought iron machined on four sides. The motor truck transoms are rolled steel channels and the trailer truck transoms are forged wrought iron. The side bearings are cast-steel provided with liners for adjustment of height and wear. The wheels of the motor truck are steel-tired with cast-steel spoke centers. They are 36 in. in diameter with M. C. B. standard tread. The hub of one wheel on each axle of the motor truck is extended and to this hub the forged steel gear is shrunk after the wheel has been pressed on the axle. The axles are of open hearth steel with journals 5 in. x 9 in. Schoen solid rolled steel wheels, 33 in. in diameter, are used on the trailer truck. The trailer truck axles have 4¼ in. x 8 in. journals. The brakes on both motor and trailer trucks are inside-hung with Davis brake-beams. The contact shoes are carried on wood beams supported from the face of the extended equalizer spring seats, allowing for adjustment in height. The motor and trailer trucks for 65 of the cars were built by the Baldwin Locomotive Works, and for the other three cars by the J. G. Brill Company. On each car are two 200 h.p. motors. The equipment is General Electric standard, the Sprague-General Electric Automatic Type M control being used. All the cables are run in grounded loricated conduits. The cars are equipped with hand brakes and with Westinghouse quick-service automatic air-brakes.

The effect of the railroad ticket tax in Germany is indicated by the passenger earnings of the Prussian and Hessian State Railroads in August, the first month of the taxes. During the first four months of the fiscal year ending with July their passenger earnings had increased no less than 9 per cent., reflecting the high degree of prosperity prevailing, which is as noticeable this year in Germany as in this country. In August the increase was a little less than 3½ per cent. As the imposition of the tax was known long beforehand, doubtless more than usual of the important summer pleasure travel was done before August, to save the increased cost, thus swelling June and July and reducing August earnings. The later months will show better the permanent effect of the tax.

Poor's Statistics for 1905.

Advance sheets of *Poor's Manual* for 1906 contain the usual summary of statistics of the railroads of the United States for the fiscal years of the companies ending in 1905.

The total length of all railroads completed on December 31, 1905, is given as 217,341 miles, an increase for the year of 4,947 miles; for the previous year these figures were 212,249 miles completed December 31, 1904, an increase of 5,014 miles over 1903. Again, as in 1904, the heaviest construction of the year was in the Southwestern group of states in which 1,140 miles were built, divided as follows: Texas, 337; New Mexico, 154; Oklahoma, 153; Arkansas, 213; Indian Territory, 101; Colorado, 87; Missouri, 63; Kansas, 32. There were 1,716 miles built in this group in the previous year. North Dakota easily leads all separate states in amount of new mileage with 533 miles, Georgia is third with 257 miles, Illinois fourth with 216 miles, and Indiana sixth with 200 miles.

The following table gives the totals of the principal statistics for the two years:

	1905.	1904.
Mileage of railroads	212,624.18	211,074.39
Second track, sidings, etc.	88,707.57	82,863.03
Total track	301,331.75	293,937.42
Steel rails in track	290,529.24	282,229.35
Iron rails in track	10,802.51	11,708.07
Locomotives, No.	49,616	47,844
Cars: Passenger	30,777	29,205
" Baggage, mail, etc.	10,552	10,417
" Freight	1,757,105	1,691,427
Total revenue cars	1,798,434	1,731,049
Liabilities:	$	$
Capital stock	6,741,956,825	6,447,045,374
Bonded debt*	7,821,243,106	7,462,091,455
Unfunded debt	201,978,773	172,619,537
Current accounts	620,720,096	516,404,178
Sinking and other funds	182,853,229	203,962,204
Total liabilities	15,568,752,029	14,802,122,748
Excess of assets	650,821,816	620,750,567
Total	16,219,573,845	15,422,873,315
Assets:		
Cost of railroad and equipment	12,143,997,551	11,664,191,134
Other investments	2,935,276,877	2,712,445,967
Sundry assets	367,454,847	408,808,136
Current accounts	772,844,570	637,328,078
Total assets	16,219,573,845	15,422,873,315
	Miles.	Miles.
Miles of railroad operated	215,506.92	211,835.21
Rev. train mileage:		
Passenger	467,270,447	446,890,386
Freight	559,434,683	543,447,633
Mixed	26,715,494	28,069,524
Total	1,053,420,624	1,018,407,543
Passengers carried	745,446,641	719,173,676
Passenger mileage	23,906,420,668	22,108,484,473
Tons freight moved	1,435,321,748	1,295,527,441
Freight mileage	187,375,621,537	172,627,299,384
	$	$
Traffic earnings—Passenger	486,420,902	456,342,380
Freight	1,478,167,246	1,377,281,206
Miscellaneous	147,609,622	144,015,127
Total	2,112,197,770	1,977,638,713
Net earnings	685,464,488	639,240,027
Other receipts	80,927,659	81,357,891
Total available revenue	766,392,147	720,597,918
Payments:		
Interest on bonds	247,155,897	242,992,755
Other interest	12,956,346	13,533,529
Dividends on stock	193,753,869	188,386,093
Miscellaneous	59,856,679	54,557,670
Rentals—Interest	31,716,773	32,807,445
Dividends	22,314,069	23,254,134
Miscellaneous	22,208,880	18,120,396
Taxes	54,553,620	54,325,856
Total payments	644,516,133	627,977,878
Surplus	121,876,014	92,620,020

*Including, in 1905 and 1904, real estate mortgages, equipment trust obligations, etc., previously included in item "Unfunded Debt."

Total traffic revenue (based on 215,507 miles increased 135 millions, or about 6.4 per cent., against an increase of 69 millions, or about 3 per cent., in 1904, and an increase of 188 millions, or about 10 per cent., in 1903. Freight earnings rose 101 millions, as against 29 millions in 1904, and 147 millions in 1903, and passenger earnings 30 millions, as against 26 millions in 1904, and 33 millions in 1903.

The following table shows the average miles operated, capital

per mile and bonded debt per mile of all steam railroads in the United States for the past five years:

	Mileage worked.	Capital Stock per mile.	Bonded Debt per year.
1901.....	195,887	30,521	30,811
1902.....	199,685	30,439	32,377
1903.....	206,876	30,719	32,495
1904.....	211,074	30,686	32,731
1905.....	212,624	31,708	34,875

Gross earnings per mile of road in operation in 1905 amounted to $9,643, and net earnings to $3,135, as compared with $9,248 and $2,989 per mile in 1904. The average ton mile rate received was 7.84 mills, as against 7.93 mills in 1904. Up to 1905 this average showed a steady increase since 1899, when rates touched the lowest point with a ton-mile rate of 7.26 mills. The year 1905 marks the first decrease since 1899 in the average rate received.

The average revenue per freight train mile was $2.63, against $2.53 in 1904, and $2.45 in 1903, indicating a steady growth in amount of traffic and operating efficiency. Earnings per freight train mile have steadily increased since 1894, when the average revenue was $1.47. Herein is clearly reflected the development of the modern large train load. The average receipts per passenger mile in 1905, 1904 and 1903 were respectively 2.028 cents, 2.058 cents, and 2.052 cents. The lowest point in the passenger mile rate was in 1898, when the average revenue was 1.994 cents per passenger per mile.

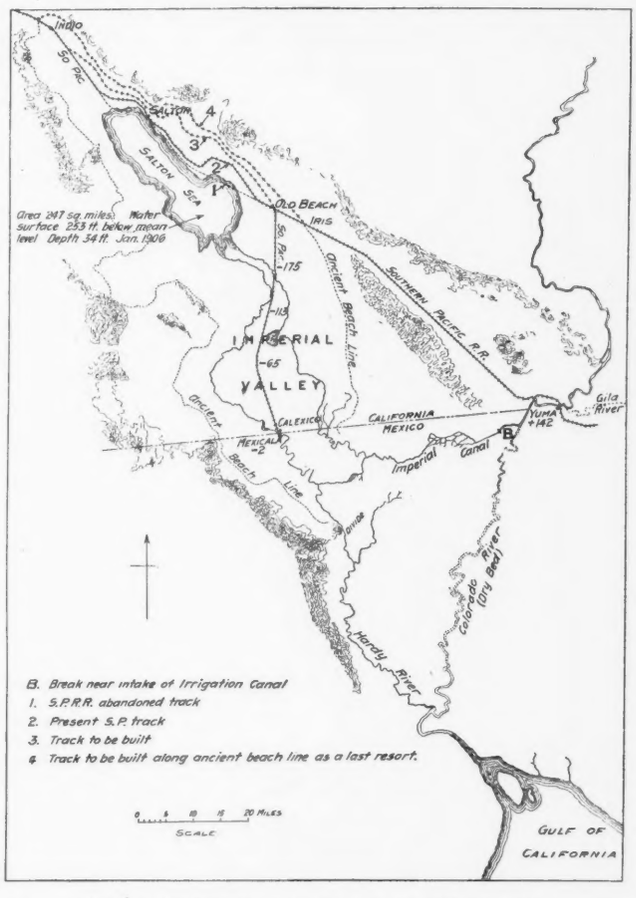
The average rate paid on the total bonded debt was 3.65 per cent. in 1905, 3.98 per cent. in 1904, and 4.13 per cent. in 1903, while the average dividend rate paid on the total share capital was 3.02 per cent. in 1905, as compared with 3.14 per cent. in 1904, and 3.00 per cent. in 1903. In 1897 only 1.49 per cent. rate was paid. The ratio of operating expenses to earnings in 1905 was 67.45, as against 67.68 in 1904.

The Salton Sea Conquered.

The engineers of the Southern Pacific and of the California Development Co. have at last controlled the flow of the Colorado river into the great Salton Sink after working heroically for nearly two years. The Salton Sink is a large depression in southern California with a minimum elevation of 297 ft. below sea level. The main line of the Southern Pacific passes through Yuma, Ariz., and at Drylyn, 23 miles west of Yuma, it begins to descend into the valley of the Salton Sink. At Iris, shown on the accompanying plan, the line has an elevation of +71.6. It descends rapidly and for a distance of 62 miles is below sea level, the lowest point at Salton having an elevation of —265 ft. From Salton the line rises to Indio and from there begins to climb on a grade of 100 ft. to the mile to the summit at Beaumont, 50 miles further west. The Salton Sink was originally no doubt under the waters of the Gulf of California, but some volcanic upheaval cut off communication with the Pacific ocean and left this large area under water, which the heat of the sun during the course of many years gradually evaporated and created a salt desert. In the southern part of the valley thus formed, where the elevation is from —100 ft. to sea level, the silt from the surrounding mountains has been gradually washed down and has converted the ground into a fertile valley which needed only water to make it a garden spot.

In 1896 the California Development Co. was organized to build a system of canals for diverting part of the water of the Colorado river into a system of irrigating canals and thereby reclaiming for agricultural purposes many thousand acres in the so-called Imperial Valley, which lies to the south of the Salton Sink. A headgate was built in the north bank of the Colorado river eight miles below Yuma and water was turned into the main canal in March, 1902. In the summer of 1904 the head waters of this canal for a distance of about four miles below the gate became choked with silt carried down by the summer floods, and the volume of water flowing in the canal was greatly reduced. In order to provide for the large amount of water necessary to meet the demands during the winter the engineers of the company decided to dredge a temporary intake canal about four miles below the permanent gate and to construct temporary controlling works pending the dredging of the upper four miles which were choked up. In December, 1904, an unexpected flood damaged the temporary controlling works and this was followed by a series of floods which completely destroyed them. The canal opening was rapidly enlarged by the erosion of the rapidly flowing waters and soon the break in the bank of the Colorado river assumed such large proportions that the entire flow of the river was deflected into the main canal and over the surrounding country. The water found its way into the old bed of the Alamo river and into the New River. Both of these streams flow north into the Salton Sink and the water soon began to rise in that depression at the rate of two or three inches a day. By July, 1905, the water had reached the tracks of the Southern Pacific, and as it continued to rise short detours were built in the hope that the flow through the break might be controlled. The original line of the Southern Pacific is shown at 1 on the accompanying drawing. It soon became necessary to build an entirely new detour line about 40 miles long at an elevation of about 70 ft. above the old line, and 37 miles of the old line, which had been flooded, were abandoned.

In the meantime the Southern Pacific had taken over control of the California Development Co. in order to protect its property, and had jointly, with the engineers of that company and the United States Reclamation Service, begun a series of attempts at controlling the river which had broken from its bounds. The first attempt made was to throw a dam across the break, but this was washed out before it was completed. Later a jetty was built out from a small island opposite the break and it was attempted to deflect the flow of the water away from the break and through the channel on the other side of the island. This was not successful. Plans were then made for building a gate in the break large enough to pass the entire flow of the river, but as the situation became more and more dangerous, and as the gate could not be completed for some months at least, it was decided to make another attempt at closing the north channel by throwing a dam across between the bank and the small island above the break. This was washed out by the first flood. In December, 1905, work was begun on a large intake gate and the construction of an earth dam to hold back the water as the gate was gradually raised. This work has been going on all spring and summer. Six trains of dump cars have been employed day and night in hauling dirt for the dam and about



Map of the Imperial Valley and the Salton Sink.

1,000 men have been at work on the job. During the week ending Oct. 1 a heavy rain in Colorado increased the discharge of the river near Yuma from 9,000 in. to 15,000 in., but the new works stood the test of high water, which quickly receded. The river will now be forced to return to its old bed and all danger from a further rise of the water in the Salton Sink is probably past. The Southern Pacific, however, took no chances on the final success of the plan of the controlling works under way and had made all the surveys for another detour line on the —100 ft. contour. Had the water continued to rise and threaten the present line the new detour could have been built in time to prevent interruption of traffic.

Little actual damage was done in the cultivated section of the Imperial Valley, not more than 4 per cent. of the acreage under cultivation having been flooded. The water flowed through the main canals and the old river beds in the valley without flooding except in a few places. The principal damage was in the destruction of the Southern Pacific track. Now that the break has been repaired it will be possible to further enlarge the system of irrigating canals and develop the agricultural region of the Imperial Valley, which already has a population of nearly 10,000.

GENERAL NEWS SECTION

NOTES.

At Altoona, Pa., two suits have been begun by State food inspectors against the Pullman company for selling on dining cars milk and cream containing formaldehyde.

Cleveland at last has a street railroad on which passengers are carried for a three cent fare. The company has 13 miles of road in operation. On Sunday last 8,000 passengers were carried.

On Saturday, October 20, the Empire State Express was run from Utica to a point near Syracuse, 54 miles, in 45 minutes. This run was made by Engineman G. W. Gilbert with Engine No. 3865.

A Chicago newspaper, discussing the scarcity of laborers, estimates that in the territory west of Chicago the number wanted for new railroad construction at the present time is not less than 50,000.

At Wilkesbarre, Pa., Nov. 1, the conductor and the engineman of a Pennsylvania express train were arrested and fined $5 each for violating the city speed limit in running over a crossing at 35 miles an hour.

The fare between New York and Boston by the Fall River steamers is now $2.65. This rate is 35c. less than the former winter rate, all fares having been reduced on the railroad between Fall River and Boston.

A press despatch from Topeka, Kan., says that the railroads of that state, contrary to their former custom, are granting no free passes to employees of the State and to students of colleges to go home to vote.

The New York Central now serves meals by the card in its dining cars on all trains, at all times, except on the Twentieth Century Limited, the Lake Shore Limited and South Western Limited. On these trains the rate of $1 a meal is continued.

The striking machinists of the Southern Railway returned to work on November 5, under an agreement which has been reached at conferences of the railroad and brotherhood officers with Mr. Seth Low and Mr. Donnelly, of the National Civic Federation.

The Southern Pacific and the Atchison, Topeka & Santa Fe have announced that when they unload from the cars freight which takes the carload rate, a charge of 20 cents or more a ton will be made for the service, this being necessary to comply with the law forbidding discrimination.

Announcement is made that a bill is being prepared for the next New York Legislature to provide for the abolition of 203 grade crossings of streets with the Long Island Railroad in Queens Borough, New York. The work is to be extended over six years and the estimated cost is $12,000,000.

The Boston & Maine has awarded its annual premiums for the floral displays, around its stations, and the first prize goes to Hill Crossing. The agent at this station has received the first prize before. The second prize goes to Brattle, Mass., and two third prizes go to Lake City and West Lebanon.

The Bessemer & Lake Erie has sent to the Interstate Commerce Commission and to all the railroads of the country a formal notice concurring, in advance, in all joint passenger tariffs issued by common carriers naming prices over that road, except in cases where the B. & L. E. gives the Commission notice to the contrary.

The Rock Island now runs a train from Chicago to Denver connecting with the 18-hour trains from New York to Chicago so that the mail is delivered in Denver at 11:25 a. m. on the second morning after it leaves New York, or in about 44 hours, apparent time. The connection is made at Englewood, about 6 miles south of Chicago, at 8:30 a. m.

The Brooklyn Rapid Transit Company, operating the surface street railways in Brooklyn, New York, has ordered conductors to strictly limit free transfers to 15 minutes, the use of transfers having increased enormously. It is said that the number issued is now 75 per cent. greater than it was one year ago, successive transfers being now given on one fare-payment.

The New York Central, recently fined a large sum for making unlawful rates on sugar from New York to Detroit, has been summoned to appear in court and defend similar charges concerning shipments from New York to Cleveland. The shipments were made in 1902 and 1903, and rebates from 4c. to 6c. per 100 lbs. are said to have been given to the amount of $26,000. The American Sugar Refining Co. is also summoned.

A press despatch from St. Paul says that President Stickney, of the Chicago Great Western, has undertaken the task of making a freight tariff to apply throughout the country, with the expectation that he will be able to show that uniform classification of freight is practicable. As the railroads are never able to agree on this point unanimously, Mr. Stickney thinks that Congress should empower the Interstate Commerce Commission to make a uniform classification.

A press report from Gallup, N. Mex., Nov. 6, says that a passenger train of the Atchison, Topeka & Santa Fe was robbed near that place on that day by three armed men who went through the passenger cars while the train was standing on a side track, all of the trainmen being in the dining car at the time. One of the robbers walked backward and with his pistol covered the passengers after they had been robbed, and the three escaped in the darkness before the trainmen knew what was going on.

The Territory of Oklahoma in further pursuance of its campaign against the railroads has entered with the Interstate Commerce Commission complaints against sixteen companies operating mainly in the direction of Galveston. The complaint alleges that the charges for transportation of wheat in carload lots to Galveston for export are "unlawful, illegal, unjust, unreasonable and extortional," that a reasonable charge should not be more than 5 mills per ton mile; that every charge made for wheat for export to Galveston is more than 7.75 mills per ton mile. It is stated that the cost of operation of the roads from points in Oklahoma to Galveston is relatively low and does not exceed 2.5 mills per ton mile, and the cost of maintenance is also relatively low; that the transportation of wheat is very profitable relative to other traffic on those lines; that the cost of construction, fixed indebtedness, taxes and public charges are very low, and that there is a profitable return traffic. The complaint further alleges the importance of the wheat crop and the financial limitations of the people. It is stated that the charges from Oklahoma points are greater than those from points relatively distant in Nebraska, Iowa, Missouri and other surrounding territory.

Exhibition of Safety Devices.

The American Institute of Social Service, 287 Fourth avenue, New York City, Josiah Strong, president, announces that it will hold an exposition of safety devices in New York City, beginning January 28, 1907, and to extend to February 9.

A New Departure in Train Sheds.

The Commissioners of the District of Columbia have decided to adopt the "umbrella" type of train shed in the new Washington Union Station. . . . This "umbrella" type derives its name from the fact that it is portable and opens and shuts after the fashion of an ordinary umbrella.—*Washington Star.*

Washington Conference on Tariff Forms.

The Interstate Commerce Commission has set November 12 as the day for its conference with railroad officers relative to the publishing of uniform tariffs. The railroad representatives are: Lincoln Green, freight traffic manager of the Southern Railway; Joseph Richardson, Southeastern Passenger Association; G. D. Dixon, freight traffic manager Pennsylvania Railroad; C. F. Daly, passenger traffic manager New York Central; N. S. Kentfield, assistant general freight agent New York, New Haven & Hartford; C. M. Burt, general passenger agent Boston & Maine; Hudson Fitch, general freight agent Toledo & Ohio Central; James Webster, general freight agent New York, Chicago & St. Louis; F. C. Donald, commissioner Central Passenger Association; Elmer H. Wood, general freight agent Union Pacific; George C. Sommers, assistant to first vice-president Chicago, Burlington & Quincy; F. A. Leland, assistant general freight agent Missouri, Kansas & Texas; W. G. Gardiner, Southern Pacific; W. J. Cannon, assistant general passenger agent Chicago, Milwaukee & St. Paul; Y. B. Jones, Western Passenger Association.

Government Meat Inspection.

The Department of Agriculture has issued supplementary regulations for the inspection of meat designed for interstate transportation. The rule regulating the procedure when a shipment is to be diverted from its original destination is modified so that in case of a wreck or other extraordinary emergency the carrier may divert without waiting for a new certificate; but in all such cases full information must be promptly sent to the Bureau of Animal Industry.

The transportation of meat or meat food products from one point in a state or territory to another point in the same state or territory when, in course of shipment, the meat or meat food product is taken through another state or territory, is declared to be interstate commerce, and the said transportation comes under the meat inspection law and regulations. In the decision of the case of Hanley against the Kansas City Southern, January 5, 1903,

the Supreme Court of the United States, in a decision by Justice Holmes, held that such transportation as this is interstate traffic, declaring that the Pennsylvania case, on a similar subject, and applying only to a question of taxation, does not govern.

This question of the status of shipments passing from one state into another and back into the same state in which they originated may affect competitive conditions on many routes, notably those between Buffalo and New York City, three of the four lines between these cities traversing parts of Pennsylvania or New Jersey or both.

The question of federal inspection of meat has also arisen in connection with wagon traffic on the Hudson river ferries at New York City, which is interstate. Farmers, exempt from the inspection law, also cross these ferries.

New Car Ferry Steamer for St. Lawrence River.

The Canadian Pacific Car & Passenger Transfer Co., which operates a car ferry running between Ogdensburg, N. Y., and Prescott, Ont., has ordered from the Polson Iron Works, Toronto, Ont., a car ferry steamer to be delivered by October, 1907. The boat will be 280 ft. long, 40 ft. wide and will draw 12 ft. when loaded with 10 cars (her maximum capacity). Twin screws will be driven by two compound engines developing, at a working steam pressure of 185 lbs., while running 125 revolutions a minute, 1,000 h.p. each. There will be four single ended Scotch type boilers operated under Howden's system of forced draft. The boat is strongly built and heavily sheathed to protect it against the ice in the river, which is sometimes 2½ ft. thick. It will be lighted by electricity and will carry 100 passengers besides its load of cars.

Rules for Trains in Eleventh Avenue.

The railroad of the New York Central in Eleventh avenue, New York City, used almost wholly for freight and only at very low speeds by both passenger and freight trains, has been made the subject of a stringent order by the New York State Railroad Commission. The order says:

First—That freight trains on Eleventh avenue, New York City, between Thirtieth and Sixtieth streets, shall not consist of more than twenty cars.

Second—That no freight train shall be started from the Sixtieth street yard for the Thirtieth street yard until it is known at the Sixtieth street yard that there is a space in the Thirtieth street yard for the reception of said train; also that no freight train be started from the Thirtieth street yard for the Sixtieth street yard until it is known at the Thirtieth street yard that there is space in the Sixtieth street for the reception of said train. This recommendation is to be considered as being imperative when the conditions, strictly construed, render compliance practicable.

Third—That between the hours of 6:45 and 7:15 a. m., 8:30 and 9 a. m., 12 noon and 1 p. m., 3 to 3:20 and 4:45 to 5:15 p. m., no freight trains shall be operated on Eleventh avenue.

TRADE CATALOGUES.

Rail Joints and Tie Preservation.—Max Barschall, 31 Nassau street, New York City, is distributing an illustrated pamphlet devoted to rail joints and tie preservation and their importance in maintenance work. The pamphlet contains a reprint of an article by Mr. Barschall on the necessity for track improvement, from the *Railroad Gazette;* an article on wheel carrying rail joints and tie preservation from the bulletin of the International Railway Congress Association, September, 1906, as well as some interesting correspondence between Mr. Barschall and the general secretary of the permanent committee of the International Railway Congress Association.

Rock Drills.—Ingersoll-Rand Co., New York, sends catalogue No. 45B describing Ingersoll-Sergeant rock drills for mining, quarrying and general rock excavation. The matter is quite complete, showing the different machines in operation and their parts, and describing the kind of work each class of drill is best fitted for.

Signal Tower Oil Outfits.—Bulletin No. 57 of S. F. Bowser & Co., Ft. Wayne, Ind., shows the Bowser system applied to signal towers. The method of application and its advantages are described and illustrated in detail. One illustration shows an oil supply car equipped with this system.

Roofing.—The Standard Paint Company, New York, is sending samples of ruberoid roofing taken from a roof on which it was put 14 years ago, the remainder of the roofing being still in service.

Manufacturing and Business.

The output of the Pressed Steel Car Co. for the month of October was at the rate of 125 cars for each working day.

The Link-Belt Company recently opened an office at 913 Missouri Trust Building, St. Louis. E. C. Berghoeffer, who has been for some time in the Chicago house of the company, is in charge.

Iron and Steel.

The Delaware, Lackawanna & Western, the New York, New Haven & Hartford, and the Chicago, Rock Island & Pacific are negotiating for bridge material aggregating about 23,000 tons.

Contracts recently let for about 7,500 tons of rails for delivery next year, include 1,400 tons for the Puget Sound Electric, 1,000 for the Detroit & Mackinac, 500 for the Prescott & North-Western, 500 for the Brooklyn Heights, 1,000 for the Cuba Eastern, and 600 for the Coast Line Electric; also 1,800 tons for the Alabama Great Southern.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad conventions and engineering societies, see advertising page 24.)

Roadmasters' and Maintenance of Way Association.

The Roadmasters' and Maintenance of Way Association will hold its annual meeting at Chicago, beginning November 13. C. E. Jones (C., B. & Q.), Beardstown, Ill., is Secretary.

American Portland Cement Manufacturers.

The fourth annual meeting of this Association is to be held in New York City December 11 and 12, at the Hotel Astor, Forty-fifth street and Broadway. Many important subjects will be presented for discussion.

Franklin Institute.

At a stated meeting of the Section, November 8, the programme included a discussion on "The Physical Meaning of Power Factor and the Significance of a Power Factor Less Than Unity Without Phase Difference," by Prof. Albert F. Ganz, of Stevens Institute, Hoboken, N. J.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Cincinnati, New Orleans & Texas Pacific.—See Seaboard Air Line.

Coahuila & Zacatecas.—J. F. Lynch has been elected Vice-President, with office at Saltillo, Mex.

Detroit & Charlevoix.—W. P. Squier has been appointed Acting Auditor.

Illinois Central.—J. T. Harahan, Second Vice-President, has been elected President, succeeding Stuyvesant Fish.

Kentucky & Indiana Bridge & Railroad.—T. C. Powell, Vice-President, has been elected President, with office at St. Louis, Mo., succeeding W. M. Greene. W. H. McDoel succeeds Mr. Powell, with office at Chicago, Ill.

Manistique, Marquette & Northern.—W. C. J. Bienemann has been appointed Auditor, with office at Manistique, Mich.

Mobile & Ohio.—See Southern.

Ohio River & Columbus.—E. H. Blair, General Freight and Passenger Agent, has been elected also Vice-President. C. J. Finger, Auditor, has been elected also Secretary and Treasurer.

Seaboard Air Line.—William A. Garrett, General Manager of the Cincinnati, New Orleans & Texas Pacific, has been elected First Vice-President of the Seaboard Air Line, with office at Norfolk, Va., effective November 20th. Mr. Garrett was born in Mississippi in 1861 and began railroad work in 1876 as a messenger boy on the Ohio & Mississippi, now part of the Baltimore & Ohio Southwestern. He then went to the St. Louis Union Depot and worked his way up until appointed Assistant Superintendent. In 1893 he was appointed Superintendent of the Terminal Railroad Association of St. Louis, acting at the same time as Terminal Superintendent at that place of the Wabash. In 1894 he was made also Superintendent of the St. Louis Merchants Bridge Terminal. In 1896 he was appointed Superintendent

W. A. Garrett.

of the Western division of the Wabash, and a year later was transferred to the Middle division. In 1899 he went to the Philadelphia & Reading as Superintendent of the Philadelphia division. In 1900 he was made Superintendent of the New York division, and was promoted to General Superintendent in 1902. In 1903 he went to the Cincinnati, New Orleans & Texas Pacific as General Manager, which position he now holds.

Southern.—E. L. Russell, Vice-President and General Counsel of the Mobile & Ohio, has been elected Vice-President of the Southern, with office at Mobile, Ala.

Temiskaming & Northern Ontario.—J. L. Englehart has been appointed Chairman of the Commission, succeeding C. D. Smith, resigned to go into other business.

Operating Officers.

Atchison, Topeka & Santa Fe.—The new Arkansas river division consists of the line from Dodge City, Kan., to La Junta, Colo. The Western division, of which this once was a part, now extends from Newton, Kan., to Dodge City. E. A. Austin, Superintendent of the Panhandle division, has been appointed Superintendent of the Arkansas river division, with office at LaJunta.

Brockville, Westport & Northwest.—Carsten Heilshorn, Secretary, has been also appointed Manager.

Central Vermont.—Edwin D. Nash, who was recently appointed Superintendent of the Southern division, was born in Massachusetts in 1852. He began railroad work in 1868 as a brakeman on the Vermont & Massachusetts, now part of the Boston & Maine. In 1871 he went to the Central Vermont, where he has been ever since. He was appointed trainmaster in 1888, and in 1900 was made Assistant Superintendent of the Southern division, where he remained until his recent promotion.

Chicago, Lake Shore & Eastern.—J. Kirk, Assistant Superintendent, has been appointed Superintendent.

Coahuila & Zacatecas.—W. J. Browning has been appointed General Manager, with office at Saltillo, Mex.

Cumberland Valley.—J. H. Tonge, freight trainmaster, has been appointed Superintendent, with office at Chambersburg, Pa., succeeding G. W. Martin, resigned.

Denver & Rio Grande.—Hugh Wilson has been appointed Assistant Superintendent of the Second division, with office at Salida, Colo., succeeding William Edgar.

Hawkinsville & Florida Central.—S. D. Mandeville has been appointed Car Accountant, with office at Hawkinsville, Ga., succeeding R. A. Wood, resigned to go to another company.

Illinois Southern.—F. H. Van Etten has been appointed Superintendent of Telegraph, with office at Chicago.

Kingston & Pembroke.—F. Conway, General Freight and Passenger Agent, has been appointed Acting General Superintendent, succeeding F. A. Folger, Jr., heretofore General Superintendent.

Litchfield & Madison.—J. J. Reardon has been appointed Superintendent, with office at Edwardsville, Ill., succeeding L. P. Atwood.

Manistique, Marquette & Northern.—J. A. Robinson has been appointed Superintendent, with office at Manistique, Mich.

Minneapolis, St. Paul & Sault Ste. Marie.—W. A. Cole has been appointed Assistant Superintendent at Enderlin, N. Dak.

Montana.—Hugh Spencer has been appointed Superintendent, with office at Helena, Mont.

National of Mexico.—H. H. Allison, who was recently appointed Superintendent of Terminals at Monterey and also Superintendent of the Matamoras branch, was born in Tennessee in 1867 and graduated from the University of Tennessee in 1885. He began railroad work, after leaving college, as a telegraph operator on the Richmond & Danville, now part of the Southern. After working up to train despatcher he went to the Central of Georgia in 1890 as assistant yardmaster. Two years later he was made chief despatcher and trainmaster of the Knoxville, Cumberland Gap & Louisville, now part of the Southern, and in 1894 went to the Mexican National as chief clerk to the Superintendent of Motive Power. He has been in the service of that company, and its successor, the National of Mexico, ever since, acting as chief clerk to the Superintendent, train despatcher, chief train despatcher and trainmaster.

New York, Chicago & St. Louis.—William L. Blair, who was recently appointed Superintendent of Transportation, was born in Ohio in 1858. After a high school education he began railroad work in 1872 as telegraph operator on the Cincinnati, Hamilton & Dayton. Six years later he was made chief clerk to the General Superintendent of that road, and in 1881 went to the New York, Chicago & St. Louis as chief clerk to the General Superintendent. He was appointed Superintendent of the Eastern division in 1893, and in 1901 was appointed Superintendent of Telegraph. In 1905 he was again made Superintendent of the Eastern division, where he remained until his recent promotion.

Panama.—W. G. Bierd, Superintendent, has been appointed General Manager, with office at Colon.

St. Louis & San Francisco.—H. D. Teed has been appointed Superintendent of Telegraph and H. C. Sprague has been appointed Assistant Superintendent of Telegraph, both with offices at St. Louis, Mo.

Southern Indiana.—M. E. Sebree has been appointed Superintendent, with office at Terre Haute, Ind., succeeding F. S. Lewis, resigned.

Tehuantepec National.—J. J. Lewis has been appointed Superintendent of Terminals at Coatzacoalcos, Mex., succeeding G. L. Hatley, resigned.

Wabash.—J. E. Stumpf, Superintendent at Springfield, Ill., has been appointed Superintendent at Moberley, Mo., succeeding Richard Doyle, resigned. C. E. Brown, trainmaster at Decatur, Ill., succeeds Mr. Stumpf.

Traffic Officers.

Galveston, Harrisburg & San Antonio.—J. R. Christian, Assistant General Freight Agent, has been appointed General Freight Agent, with office at Houston, Tex., succeeding C. K. Dunlap, promoted. H. C. Reese, Assistant General Freight Agent of the Houston & Texas Central, succeeds Mr. Christian, with office at Houston, Tex.

Houston & Texas Central.—See Galveston, Harrisburg & San Antonio.

Mobile & Ohio.—W. K. Vandiver has been appointed Assistant General Freight Agent, with office at St. Louis, Mo.

Nashville, Chattanooga & St. Louis.—Charles Barham, Assistant General Freight Agent, has been appointed General Freight Agent, succeeding G. R. Knox, deceased.

Engineering and Rolling Stock Officers.

Atchison, Topeka & Santa Fe.—M. J. Drury, Master Mechanic at Raton, N. M., has been appointed Mechanical Superintendent of the Western grand division, with office at La Junta, Colo., succeeding C. M. Taylor.

Canadian Pacific.—R. F. Tyne, locomotive foreman at Brandon, Man., has been appointed Master Mechanic at Moosejaw, Sask.

Chicago, Rock Island & Pacific.—J. B. Kilpatrick has been appointed Superintendent of Motive Power, with office at Chicago, succeeding L. W. Harrison, Acting Superintendent of Motive Power.

Colorado & Southern.—F. M. Mahl, Mechanical Engineer of the Southern Pacific, has been appointed Mechanical Engineer and Purchasing Agent of the Colorado & Southern, effective November 15th.

Montana.—J. A. Green has been appointed Acting Chief Engineer, with office at Helena, Mont., succeeding F. T. Robinson.

New York Central & Hudson River.—The organization for electric zone improvements has been revised as follows: E. B. Katte, Electrical Engineer, has been appointed Chief Engineer of Electric Traction, with office at New York city. G. A. Harwood, Terminal Engineer, has been appointed Chief Engineer of Electric Zone Improvements, including electric traction and signals. J. D. Keiley has been appointed Electrical Engineer. Carl Schwartz has been appointed Engineer of Power Stations. W. H. Knowlton, Principal Assistant Engineer, has direct charge of all construction work under contract and right of way matters from the south bank of the Harlem river north to Peekskill and Northern White Plains. Resident engineers in this territory report to him. J. L. Holst, Engineer of Bridges, has been appointed Engineer of Structures in charge of the design and erection of all steel work in the electric zone, excepting the erection in the Grand Central Terminal; he will also have charge of the design of all buildings not in charge of the Associated Architects, the design of all structures north of the south bank of the Harlem river. W. F. Jordan has been appointed Terminal Engineer in charge of the design and building of the Grand Central Terminal, and other electric zone improvement work south of the south bank of the Harlem river, except structural steel design and work in charge of the Associated Architects. L. H. Byam is appointed Engineer of Company Forces, succeeding G. A. Berry, resigned to go into other business. Mr. Byam reports to the Principal Assistant Engineer.

Southern Pacific.—See Colorado & Southern.

LOCOMOTIVE BUILDING.

The Mexican Railway will shortly be in the market for several oil burning locomotives.

The Pennsylvania is building at its Juniata shops 25 heavy freight engines for delivery this winter.

The Western of Havana is about to order one locomotive. L. J. Buckley & Co., New York, are the purchasing agents.

The Norfolk & Western, as reported in our issue of October 19, has ordered 15 Pacific (4-6-2) type locomotives from the Baldwin Locomotive Works.

The Krawjewski-Pesant Co., 32 Broadway, New York, has ordered three 60-ton locomotives from the Baldwin Locomotive Works for use on the Central Andreita and other Cuban sugar plantation railroads.

The Grand Trunk has ordered 30 Richmond compound consolidation (2-8-0) type locomotives from the Locomotive & Machine Co. of Montreal, and 14 six-wheel switching (0-6-0) locomotives from the American Locomotive Co.

The Oliver Iron Mining Co., Duluth, Minn., has ordered 27 simple six-wheel switching (0-6-0) locomotives from the American Locomotive Co. and 22 simple six-wheel switching (0-6-0) locomotives from the Baldwin Locomotive Works. The specifications are as follows:

General Dimensions.

Type of locomotive	Switching.	
No. from each company	27	22
Weight, total	121,200 lbs.	86,000 lbs.
Diameter of drivers	50 in.	
Cylinders.	19 in. x 26 in.	17 in. x 24 in.
Boiler, type	Straight top.	
" wkg steam pressure	180 lbs.	
" No. of tubes	190	134
" tubes, material	Shelby steel.	
" diam. of tubes	2¼ in.	2 in.
" length of tubes	10 ft. 6 in.	13 ft. 6 in.
Firebox, grate area	22.16 sq. ft.	14.4 sq. ft.
Heating surface, total	1,309.0 sq. ft.	1,015.0 sq. ft.
Tank capacity	4,000 gals.	3,000 gals.
Coal capacity	6 tons.	5 tons.

Special Equipment.

Air brakes	Westinghouse
Boiler lagging	Magnesia
Couplers (for 27 locomotives)	Climax
Headlights (for 22 locomotives)	Dressel
Injectors	Nathan
Piston rod packings	Metallic-Reliance
Valve rod packings	Metallic-Reliance
Safety valves	Crosby
Sanding devices (for 27 locomotives)	Leach
Sight-feed lubricators	Nathan
Steam gages (for 22 locomotives)	Ashcroft

CAR BUILDING.

The Great Northern has ordered 3,000 box cars from Haskell & Barker.

The Southern Pacific is reported to be in the market for 50 refrigerator cars.

The Atchison, Topeka & Santa Fe has ordered 15 chair cars, 17 baggage and five postal cars.

The Chicago Terminal Transfer is asking bids on 300 dump cars of 100,000 lbs. capacity.

The St. Louis & San Francisco has ordered 250 gondolas from the American Car & Foundry Co.

The Northern Pacific has ordered 500 Hart convertible Rodger ballast cars of 80,000 lbs. capacity.

The Boston & Maine has ordered 100 Hart convertible Rodger ballast cars of 80,000 lbs. capacity.

The Denver, Northwestern & Pacific has reserved space with the Pullman Co. for passenger equipment.

The Lake Shore Electric has ordered eight Hart convertible Rodger ballast cars of 80,000 lbs. capacity.

The Atchison, Topeka & Santa Fe has ordered 400 Hart convertible Rodger ballast cars of 100,000 lbs. capacity.

The Tonopah & Goldfield has ordered 15 box cars of 60,000 lbs. capacity from the Hicks Locomotive & Car Works.

The Seaboard Air Line, as reported in our issue of October 12, has ordered 1,000 box cars from the Pressed Steel Car Co.

The Barrett Manufacturing Company, Chicago, has ordered 30 steel tank cars of 10,000 gallons capacity from the American Car & Foundry Co.

The Wabash is in the market for 3,000 steel underframe box cars of 80,000 lbs. capacity and 4,000 hopper bottom steel gondolas of 100,000 lbs. capacity.

The Krawjewski-Pesant Co., 32 Broadway, New York, has ordered from the Ramapo Iron Works 20 cars for a Cuban sugar plantation railroad in the Cienfuegos district.

The Norfolk & Western, as reported in our issue of October 19, has ordered 25 coaches and 10 express cars from the Hicks Locomotive & Car Works, and four combination passenger and baggage cars from the Harlan & Hollingsworth Co. The specifications for these cars were published in our issue of October 19.

The Chesapeake & Ohio, as reported in our issue of October 5, has ordered 421 box cars, 148 flat cars and 77 stock cars, all of 80,000 lbs. capacity, from the American Car & Foundry Co., for January and February, 1907, delivery. The specifications for the box cars were published in our issue of October 5. The flat cars will be 38 ft. 5½ in. long and 9 ft. 6 in. wide, over all. The stock cars will be 37 ft. 10½ in. long, 8 ft. 11½ in. wide and 13 ft. 1¾ in. high, over all. The special equipment for the flat and stock cars includes:

Brakes	Westinghouse
Brake-beams	Monarch
Brake-shoes	American Brake Shoe & Fdy. Co.
Brasses	Ches. & Ohio standard
Door fastenings (for stock cars)	Security
Draft rigging	Miner
Paint	Ches. & Ohio standard
Roofs (for stock cars)	Murphy
Trucks	Ches. & Ohio standard
Wheels	American Car & Foundry Co.

RAILROAD STRUCTURES.

BIRMINGHAM, ALA.—Announcement is made that the Louisville & Nashville has purchased land in Talladega at a cost of $25,000 as a site for better terminal facilities.

DULUTH, MINN.—The Northern Pacific and the Terminal Railroad Companies will jointly spend about $85,000 for building an extension of the Belknap street viaduct next spring. The proposed structure will connect with the viaduct over the Great Northern tracks almost as far as Oakes avenue, also over all the tracks of the various roads at Belknap street between Elmira and Oakes avenues.

KANSAS CITY, MO.—The Chicago, Rock Island & Pacific, it is said, has bought a large plot of ground in Armourdale, probably for new shops.

MEDINA, N. Y.—The New York Central & Hudson River has given a contract to Mallison & Soucie for putting up a new brick and stone passenger station, 53 ft. x 93 ft., to cost approximately $50,000. The new station is to be located east and north of the present structure.

OMAHA, NEB.—The Chicago & North-Western has ordered the construction of a new freight house here and will make other improvements to cost about $600,000.

The Union Pacific has been granted a building permit to put up new shops at a cost of $150,000. Bids are being received for a brick paint shop one and a half stories, 60 ft. x 300 ft.

PHILADELPHIA, PA.—For the storage of export freight routed through Philadelphia, the Pennsylvania will build, at Girard Point, a big storehouse pier, with a capacity of at least 250 carloads, and possibly double that amount.

YOUNGSTOWN, OHIO.—The Youngstown & Southern has been granted a permit to put up a brick and stone combined passenger and freight station on Front street to cost about $15,000.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

ARKANSAS, OKLAHOMA & WESTERN.—Incorporated in Oklahoma with $4,000,000 capital, with offices at Blackburn, Okla., Fayetteville, Ark., and Caney, Kan. The promoters propose to build a line from Fayetteville, Ark., northwest through the Cherokee Indian Nation to Caney, 160 miles, with a branch from Vinita, Ind. T., to Pawnee, Okla., an additional 100 miles. The cost of construction is estimated at $25,000 per mile. The incorporators include: B. F. Campbell and J. R. Harris, of Fayetteville; W. C. Meeks and G. H. Work, of Caney; Z. T. Conley, of Siloam Springs, Ark.; F. Rush, of Blackburn; J. A. Orendorff, of Vinita; F. Hudson and C. E. Vandervoort, of Pawnee.

ARKANSAS PACIFIC.—An officer writes that this company, which was recently incorporated in Oklahoma to build about 1,500 miles of road, has completed preliminary surveys and is now making location surveys. Contracts for some of the work are to be let about February 1st of next year. George D. Locke, St. Louis, is President; T. D. Kinman, Newport, Ark., Vice-President, and James Gates, St. Louis, Secretary and Treasurer. (Oct. 26, p. 113.)

ATLANTA, GRIFFIN & MACON (ELECTRIC).—This company has com-

pleted surveys for its proposed line from Atlanta, Ga., to Macon, about 90 miles, and expects to have the line in operation in about one year. Surveys will shortly be started from Macon south to Albany, about 100 miles. This part of the work is to be carried out by the Interurban Construction Co. W. J. Kincaid, of Griffin, Ga., is President of the Atlanta and Macon line, and Joseph S. Davis President of the Macon and Albany line.

BEAUMONT & GREAT NORTHERN.—This company has opened its road for business from Trinity, Tex., south to Onalaska, 20 miles.

BERING, KIAM & SOUTHERN.—Incorporated in Texas with $75,000 capital by Conrad Bering, R. B. Landrum, W. C. Bevan, F. C. Bering, of Houston; James E. Hill, of Lexington; C. H. Mason, of Bering, and others. The company has been formed to build a line from Bering, in Polk County, on the Houston East & West Texas, southeast to Kiam, in the same county, about 15 miles.

BIRMINGHAM & MISSISSIPPI SOUTHERN.—Incorporated at New Orleans to build a line from Baton Rouge, La., northeast to Birmingham, Ala., about 250 miles. The company proposes to secure an entrance into New Orleans over an existing road. The plans also include the building of a branch line from Waynesboro, Miss., on the Mobile & Ohio south to Scranton, an additional 100 miles. Arrangements have been made to start preliminary surveys at once. The incorporators are principally New Orleans and Mississippi capitalists. William A. Aaron, an attorney of Hattiesburg, Miss., was the chief organizer of the company.

BUFFALO & SUSQUEHANNA.—This company has completed track laying on its new line from Wellsville, N. Y., northwest to Buffalo, 80 miles. At Landon Brook much trouble was experienced because of the continuous slipping of the heavy fill at that point. The line is laid with 80-lb. rails, and all bridges and culverts are of heavy concrete and steel construction. The line has low grades and easy curvatures. Passenger service has been in operation for some time from Springville south, and recently from Boston to Blaisdell, near the northern end of the line. It is expected to have the entire road opened for both passenger and freight service before the close of this year.

CHICAGO, JOLIET & KANSAS CITY.—This company, which was recently incorporated in Chicago with $12,000,000 capital, is said to be a Harriman project. Surveys are said to have been made via Joliet, Peoria and Beardstown, crossing the Mississippi river at Quincy. The line will have a total length of 450 miles between Chicago and Kansas City. J. C. Eden is President; B. F. Hardesty, Chief Engineer, and C. A. Denham, Construction Engineer, 608 Rector Building, Chicago. (Oct. 19, p. 106.)

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—The stockholders have agreed to increase the common stock $10,000,000 to provide funds for double-tracking and to make other improvements and for new equipment.

COFFEYVILLE & MEMPHIS.—Incorporated in Oklahoma with $500,000 capital to build a line from Coffeyville, Kan., on the Atchison, Topeka & Santa Fe, the Missouri, Kansas & Texas, and the Missouri Pacific, southeast through Oklahoma via Centralia and Afton to the Arkansas state line, thence in Arkansas through the counties of Benton, Madison, Newton, Searcy, Vanburen, Cleburne, White, Prairie, Monroe, St. Francis and Crittenden to the Mississippi river, about 375 miles, with a branch 150 miles long southwest from a point on the main line to Shawnee, Okla. The incorporators include J. O. Hall, W. P. Brown, E. A. Rosser, P. H. Grahon, E. C. Kiddoo, George A. Gabbler, J. E. McClunry, A. J. Yoke and W. C. Hall, all of Coffeyville; J. I. Lehman, of Centralia, Kan.; C. E. Bennett and O. N. Selby, of Oklahoma City.

DULUTH, RAINY LAKE & WINNIPEG.—This company has extended its road from Ashawa, Minn., north to Gheen, 11 miles.

EAST ST. LOUIS, COLUMBIA & WATERLOO.—This company, which proposes to build a line from East St. Louis, Ill., south to Waterloo, 23 miles, has completed surveys and secured rights of way for part of the distance, and will probably let contracts for the work early next year. Negotiations are now pending to finance the road. E. F. Schoening, of Columbia, Ill., is President. (Sept. 21, p. 75.)

GEORGIA, FLORIDA & ALABAMA.—Contracts have been given by this company to Hardaway & Money to build an extension of its road from the College street terminal to the Depot street terminal in Cuthbert, Ga. Work will be started at once. On the completion of this work contracts will probably be let for extending the line north to Columbus.

GLENVILLE & KANAWHA.—Surveys are being made by this company for building about 30 miles of road. R. L. Ruddell, of Glenville, W. Va., is General Manager.

GRAND TRUNK.—This company has made application to the Canadian Government for authority to build its projected short line from Kingston to Ottawa via Smith's Falls. The company has secured the rights of the Kingston, Smith's Falls & Ottawa, whose charter has lapsed, and has secured the bonus promised by Ottawa; also bonuses from other towns interested in the construction of the line.

GREAT NORTHERN COAL & COKE.—This Chicago company, it is said, is making plans to build a line about 100 miles long from Ashland, Ky., to the coal fields which it owns in the Big Sandy basin. Eugene Zimmerman is interested in the project.

LOUISIANA RAILWAY & NAVIGATION CO.—This company has completed its line to New Orleans, and expects next month to begin running passenger and freight trains between that city and Baton Rouge. Connection is to be made with the northern end of the road from this point by ferry a distance of about eight miles along the Mississippi river from Angola to Watertown. The main line from Shreveport southeast to New Orleans is about 315 miles long, and it is expected that through trains will be run over the entire line by the first of the year. It is reported that the Missouri, Kansas & Texas has made an agreement with the company to use the new section of the road. The company is also planning to build a branch from Hessamer, La., north to Marksville, about seven miles.

LOUISVILLE & NASHVILLE.—This company is making surveys near Pineville, Ky., for a line up the right fork of Straight creek, seven miles, to coal fields recently bought by the North Jellico Coal Co.

MICHIGAN ROADS (ELECTRIC).—Plans are being made to organize a company with $2,500,000 capital to build an electric line to traverse the northern part of Muskegon County, Mich. The line will pass through the fruit belt, touching Hart, and thence run north via Pentwater, with a terminus at Ludington. The company will take over the rights of the Western Michigan Interurban, projected some time ago, and for which franchise and right of way have been secured. E. R. Trowbridge, of Chicago and Detroit, is the chief promoter.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company has opened its Flaxton line for business from Flaxton, N. Dak., west to Ambrose, 50.4 miles. The company has also started a tri-weekly train service on the Egeland line of the Winnipeg division, from Egeland, N. Dak., to Armourdale, 21.6 miles.

MISSOURI PACIFIC.—The St. Louis, Iron Mountain & Southern, it is said, will build a 20-mile line from its main line at Henson, Mo., south to Hickman, Ky., using the Nashville, Chattanooga & St. Louis terminals at that place.

MUNISING RY.—This company has extended its road from Little Lake, Mich., west to Princeton, seven miles.

OCILLA & VALDOSTA.—This company will extend its road from Ocilla, Ga., south to Allapaha, 17 miles, early next year. About six miles of grading has been finished.

OKLAHOMA, TEXAS & WESTERN.—This company, which was recently incorporated in Oklahoma, to build about 80 miles of road, has let a contract to build a section of the proposed line, from Clinton northwest to Cheyenne, about 20 miles. Connection is to be made with the Kansas City, Mexico & Orient, also with the St. Louis & San Francisco at Clinton. Work is to be started as soon as the necessary franchise and rights of way are secured. (Oct. 26, p. 115.)

ORANGE & KEYSVILLE.—This company, it is said, is asking bids for its proposed line from Dillwyn, Va., on the Chesapeake & Ohio, south via Farmville to Keysville, 40 miles. Surveys have been made and grading is finished for 10 miles. R. T. Hubard, of Dillwyn, Va., is President.

PACIFIC & EASTERN.—This company has been incorporated in the state of Washington with $150,000 capital by W. G. Hyman, of California; W. S. Cram and H. G. Shoemaker, of South Bend; T. H. Donovan, of Raymond, Wash., and others to build a line from South Bend, Wash., east to Chehalis, about 45 miles. Both of these places are on the Northern Pacific.

PENNSYLVANIA LINES.—This company, according to reports from Hammond, Ind., will soon begin the construction of large yards in that city. Twelve miles of track will be laid at North Hammond to accommodate 1,000 cars, and at Fifty-sixth street there will be a yard with a capacity of 60 cars.

PRINCE EDWARD ISLAND.—This company has opened a new line from a point on its road one mile from Cardigan, at Montague Junction to Montague, six miles.

ROSCOE, SNYDER & PACIFIC.—An officer writes that the projected route of this company's proposed line is from Roscoe, Tex., on the Texas & Pacific northwest via Snyder to the New Mexico state line, about 200 miles. Contracts for grading 30 miles have been let to Col. N. T. Reed, Armour, Tex., to be done within six months. The line will be almost straight, over a level section, and all the work will be easy. Contracts for rails have also been let, for delivery during next April. F. W. James, of Abilene, is President, and Martin Duval, of Roscoe, Chief Engineer. (Oct. 19, p. 107.)

St. Joseph Belt & Interurban.—Incorporated in Missouri with $1,500,000 capital, and office at Jefferson City, by capitalists of St. Joseph, including Dr. John S. Logan, J. J. Peter, J. Townsend, J. W. Brockett, J. E. Dolman, J. H. McCord and others. The company proposes to build a line from St. Joseph, Mo., north through Savannah to a point beyond that place, in the same general direction, not yet determined.

St. Louis & San Francisco.—A contract is reported let by this company to McCade & Steen, of Irving, to build a cut-off from Carrollton, Tex., to Irving, approximately 11 miles.

St. Louis, Iron Mountain & Southern.—See Missouri Pacific.

St. Louis, Rocky Mountain & Pacific.—This company, which is building a line from Des Moines, N. Mex., on the Colorado & Southern, west via Moreno Valley to Farmington, San Juan County, about 300 miles, with a branch from the main line at Clifton House north to Raton, six miles, has more than 55 miles of road now in operation, has the grading about completed on a continuous section of 80 miles east of Ute Park, and well advanced on the remaining 30 miles east to Des Moines. Bridge construction is well advanced at all points. Grading on the Raton branch is also completed. (Oct. 5. p. 92.)

Silver Peak.—This company, it is reported, has begun running trains on its new road from Blair Junction, Nevada, to the new town of Blair.

Southern Indiana.—The Oolitic branch of this company has been extended north to Buff Ridge, and a new line, called the Chicago Extension, has been opened for business from a new station called McKeen, on the main line between Terre Haute and Spring Hill, 3.4 miles from Terre Haute, north to Humrick, 40 miles.

Southern Pacific.—This company has given a contract to Jose Soto, of Culiacan, state of Sinaloa, Mex., for 600,000 ties to be used on the Guymas-Guadalajara extension between Mazatlan and Tepic, Mexico. The company has also imported ties from Japan.

Tallulah Falls.—This company has extended its road from Dillards, Ga., north to Prentiss, N. C., 11 miles.

Temiskaming & Northern Ontario.—The Canadian Government, it is said, has decided to extend this road from Cobalt to Petersen Lake. Surveys are now being made from the La Rose mine via the O'Brien and the Colonial silver mines.

Tennessee & North Carolina.—This road has been extended from Waterville, N. C., to Mount Sterling, two miles.

Texas Central.—This company has completed an extension of its road from Stamford, Tex., west to Rotan, 43 miles.

Waycross, Baxley & Vidalia.—Incorporation is to be asked for in Georgia by C. W. Dean, of Baxley; J. S. Bailey, W. H. Buchanan, J. T. Myers, of Waycross, and others for a company to build a line from Waycross, Ga., north to Vidalia, about 65 miles. It is said that funds have been secured to complete the road for half of the proposed distance. (May 25, p. 156.)

Western & Gulf.—Incorporated in Georgia with $400,000 capital by Frank Lanier, Lee Parker, E. C. Allen and others, to build a line connecting Hawkinsville, Americus and Dawson, Ga., 85 miles.

RAILROAD CORPORATION NEWS.

Canadian Northern.—Gross earnings for the year ended June 30, 1906, were $5,903,755, an increase of $1,713,544; net earnings $2,229,023, an increase of $683,541. The net income was $719,574, which is equal to 2 per cent. on the capital stock and is an increase of $302,871 as compared with 1905.

Chicago & Alton.—Spencer Trask & Co., New York, are offering at a price to yield 5 per cent. the unsold part of the issue of $2,260,000 Chicago & Alton Equipment Association, series D, 4 per cent. serial gold certificates guaranteed by the Chicago & Alton. These certificates are payable in 20 equal semi-annual installments beginning December 1, 1906, and were issued to pay for part of the cost of 25 locomotives and 2,000 freight cars.

Consolidated (New York, New Haven & Hartford Electric Lines).—It is reported that this company has bought, from the United Gas Improvement Company of Philadelphia, control of the Connecticut Railway & Lighting Company, which is a consolidation of a dozen street railways operating 198 miles of road in and between towns in the southwestern part of Connecticut. It has outstanding $9,191,000 common stock, $5,809,000 preferred stock, and $12,776,193 funded debt. Its gross earnings for the year ended June 30, 1906, were $2,121,044; net income $140,580.

Connecticut Railway & Lighting Co.—See Consolidated.

Hudson Companies.—Interests identified with the Hudson & Manhattan, which has built a double-track tunnel under the Hudson river from Jersey City to Christopher street, New York, and is a subsidiary of the Hudson Companies, have bought land in the block between Thirty-third street and Sixth avenue, Thirty-second street and Sevenuth avenue, for use in connection with its terminal at this point. It is said that existing leases on this property will not expire until 1909. (Oct. 12, p. 100.)

Illinois Central.—At a meeting of the directors on November 7, J. T. Harahan, Second Vice-President, was elected President, succeeding Stuyvesant Fish. The following voted for Mr. Harahan: J. W. Auchincloss, W. Luttgen, Robert W. Goelet, Cornelius Vanderbilt, J. T. Harahan, E. H. Harriman, J. J. Astor and Charles A. Peabody. Of the remaining five directors Governor Deneen, of Illinois, Charles M. Beach, Stuyvesant Fish and J. DeW. Cutting did not vote. J. C. Welling, Vice-President and a Director, was ill in Chicago.

Lake Shore Electric.—See Sandusky, Fremont & Southern.

Minneapolis, St. Paul & Sault Ste. Marie.—Gross earnings for the three months ended September 30, 1906, were $3,432,319, an increase of $590,115; net earnings $1,772,083, an increase of $198,928, the operating ratio having risen from 44.6 to 48.4.

New York, Ontario & Western.—Gross earnings for the three months ended September 30, 1906, were $2,368,642, an increase of $221,185; net earnings $924,786, an increase of $222,860. The operating ratio was 61 per cent., a decrease of 6.3 per cent.

Northampton & Hertford.—The property of this company, which owns nine miles of road from Bumbery, N. C., to Jackson, and also a mill and a tract of timber land, will be sold under foreclosure at Jackson, N. C., on November 12th.

Northern Pacific.—This company has acquired control of the Port Angeles & Peninsular, which was organized to build a 125-mile road from Quillayute, Wash., east through Port Angeles to Port Ludlow, from which point car ferry lines on Puget Sound are to connect with Seattle, 35 miles, and Everett, 26 miles. The Port Angeles & Olympia, which plans to build from Junction City, near Port Ludlow, south to Olympia, 97 miles, has also been bought by the Northern Pacific.

Ohio River & Western.—A meeting has been called for December 3 of the stockholders of this company, which owns 111 miles of road from Bellaire to Mill Run, Ohio, to authorize an increase in the capital stock from $1,200,000 to $4,000,000, and to authorize an issue of $4,000,000 5 per cent. mortgage bonds.

Pennsylvania.—A semi-annual dividend of 3½ per cent. has been declared on the $305,945,500 outstanding capital stock payable Nov. 30th to stockholders of record Nov. 5th. Since 1900 the annual dividend rate on this stock has been 6 per cent.

Peoria & Pekin Terminal.—W. T. Irwin, Peoria, Ill., has been appointed Receiver of this company on the petition of Gay & Co., Boston, who hold a judgment of $2,700 against the road. The company owns 21 miles of road, consisting of two lines, between Peoria, Ill., and Pekin, and has trackage rights over five miles of street railway in Peoria. It is operated by steam and electricity. There are outstanding $600,000 stock, $697,000 first mortgage 5 per cent. bonds of 1930, and $280,000 refunding mortgage 5 per cent. bonds of 1935. It is alleged that the company also has a floating indebtedness of $150,000, and has defaulted the July and August, 1906, interest on bonds.

Philadelphia & Reading.—Gross earnings for the three months ended September 30, 1906, were $10,055,677, a decrease of $44,741; net earnings, $3,943,045, a decrease of $401,470. R. & P. gross earnings of the Coal & Iron Company for the same period were $6,538,669, a decrease of $152,811; net earnings $60,596, a decrease of $183,901.

Port Angeles & Olympia.—See Northern Pacific.

Port Angeles & Peninsular.—See Northern Pacific.

Sandusky, Fremont & Southern (Electric).—Lomas & Nettleton, New Haven, Conn., are offering at par and interest $500,000 first mortgage 5 per cent. bonds of 1936, guaranteed by the Lake Shore Electric, which owns the entire $2,000,000 capital stock of the S., F. & S. The bonds, which are part of an authorized issue of $2,000,000, are secured by a mortgage on the 21 miles of line between Sandusky, Ohio, and Fremont, and on lines to be built from Fremont to Fostoria, 20 miles, and from Fremont to Tiffin, 20 miles.

Southern.—It is announced that this company has bought a majority of the $2,000,000 common stock of the Virginia & Southwestern, which runs from Mountain City, Tenn., via Bristol, Va., to Big Stone Gap, 130 miles.

Virginia & Southwestern.—See Southern.